THE IRON AGE

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The Improved Universal Screw Machine.

The illustrations show the improved type of multiple-spindle automatic screw machine built by the Universal Machine Screw Company, Hartford, Conn. It contains a number of radical changes from the original machine brought out by the company, which was described in *The Iron Age* February 1, 1906. Notable among the improvements is the single belt from the countershaft which provides power for all the mechanical operations of the machine, replacing the three belts of the first model, which drove the spindle, camshaft and pump, respectively. The drive of the cam shaft by a straight belt from a worm countershaft, which itself is driven direct from the main driving shaft permits the spindles to run independent of the cam shaft.

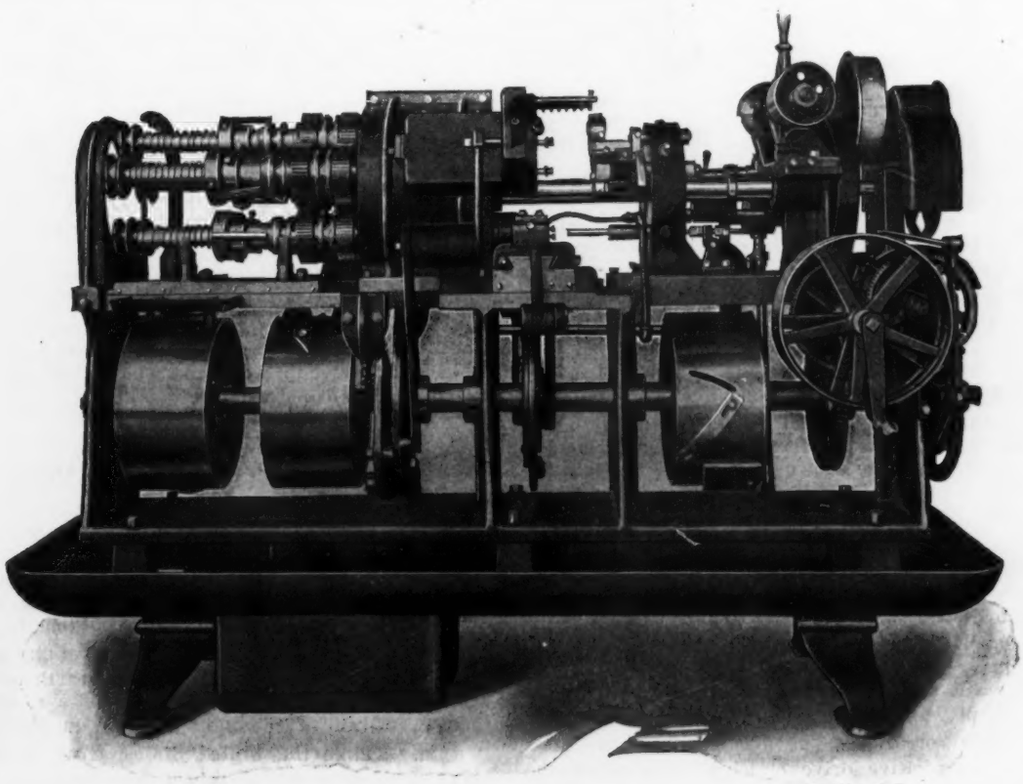


Fig. 1.—The Improved Universal Multiple Spindle Automatic Screw Machine, Built by the Universal Machine Screw Company, Hartford, Conn.

The driving mechanism of the five spindles causes each in turn, when indexed to the threading position, to reverse with slackened speed. A hand lever controls the cam shaft and affords an easy means of setting-up when feed by power is desired. Hand feed is applied by a crank fitting on the squared end of the worm shaft. The spindles are driven by positive clutches, and the locking bolt of the turret is of new design. The pump is gear driven. The machine shown is the No. 3 size, which takes work up to 1½ in. diameter, machines lengths up to 5 in., and feeds to 6 in. It is also built in two smaller sizes, the No. 1 has a capacity up to ⅝ in., and the No. 2 to ¾ in.

The single driving pulley is shown at *a*, Fig. 2. Fastened to the driving shaft is the pinion *b*, which meshes the large gear *c*, keyed to the center sleeve *d*, which drives the spindles. The ratio of gearing is 3 to 1, giving largely increased power. The worm countershaft *e*, from which the drive is transmitted to the camshaft through the medium of belt and worm shaft, is driven by the bevel gear *f* on the end of the main driving shaft, meshing the bevel gear *g*, the ratio between the gears being 2 to 1. On the end of the worm countershaft is the friction pulley *h*, which is engaged and disengaged, to start and stop the cam shaft instantly, by the shifting of the hand lever *k*, having the brake *l*, which acts directly upon the friction pulley. A collar on the end of the shaft takes the thrust of the pulley while it is engaged. The short straight belt from the worm countershaft connects the friction pulley with two pulleys on the wormshaft, the outer driving the camshaft directly for rapid indexing and for the quick advance of the tools, while the other pulley, to which the belt is shifted automatically, gives slower drive, through the medium of change gears, for feeding the tools. This arrangement also provides easy means of hand feed in setting up, the end of the wormshaft being squared for the use of a crank, shown in position in Fig. 1. The design of the camshaft drive is a departure from the common practice of driving the camshaft by a quarter turn belt and the spindles from a cross belt, both from the countershaft.

The gear driven threading mechanism is an important feature of the machine. Power is transmitted from a gear on the end of the main driving shaft to the gear *m* on the end of the center shaft *n*, through an intermediate change gear *o* on a stud in the arm *p*, which swings on a stud, the arrangement being similar to that of the common type of engine lathe. By changing this intermediate gear the operator is able to regulate the speed of the spindle while threading, to that required for any size or kind of stock. During the threading operation the spindle is revolved and the die held stationary, which permits of the cutting of a perfectly concentric screw. It will be

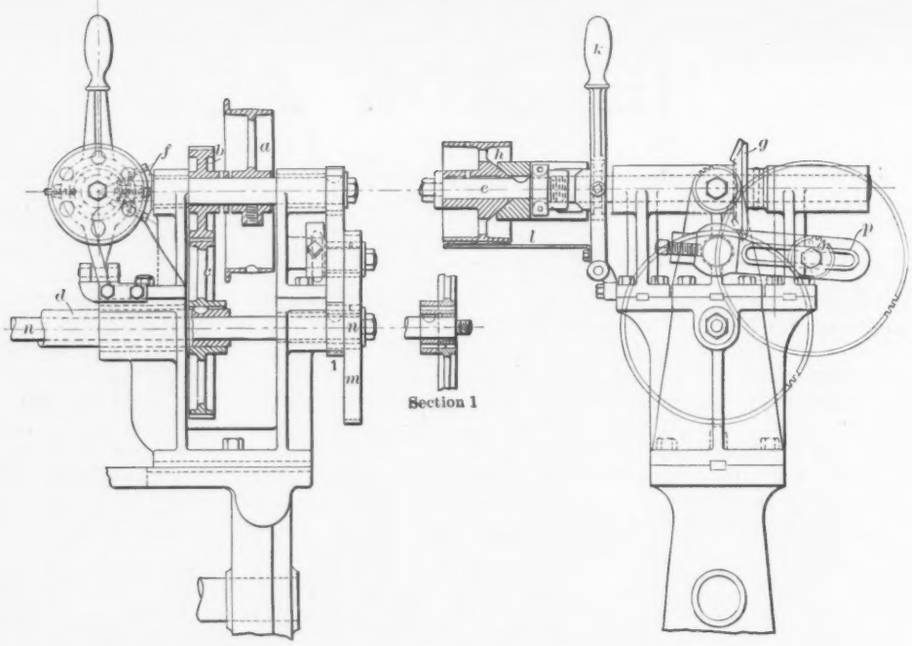


Fig. 2.—Detail of the Drive of the Improved Universal Screw Machine.

noted that no cross belts are necessary, the reverse motion being obtained through the spur gears which are always running in one direction. Neither are die pins required, as the length to be threaded is determined by two sliding collars on the center sleeve, which may be quickly adjusted.

The gear-driven pump which supplies oil to the cutting tools has a gear meshing with the large gear *c* on the center sleeve, thus doing away entirely with belt drive, the idea being to avoid any slip which might result from a belt becoming impregnated with oil, with the result of decreasing the flow of lubricant to the tools.

Another new feature of the machine is the locking pin, details of which are shown in Fig. 3. Formerly the cylinder was held in each of its five positions by a round tapered bolt. This has been replaced by the oblong shaped bolt *r*, tapered on its bottom surface and straight on the top, the unusually ample bearing surface being from 2 to 3 in., according to the size of machine. The bolt is of tool steel, hardened and ground. The pin slide, actuated by the lever *s*, acts between the cap *t* and the tapered gib *v*, thus providing for quick, parallel adjustment for wear, accomplished by means of the screw *u*, so that any play of the pin resulting from constant use may be easily corrected. The five spindles have been equipped with positive drive clutches, eliminating the possibility of slipping while threading or when the die is backing off. In addition to the five box tools there are three cross slides which act simultaneously with them, making it possible to complete almost any piece of screw machine work within the time required for the longest single operation.

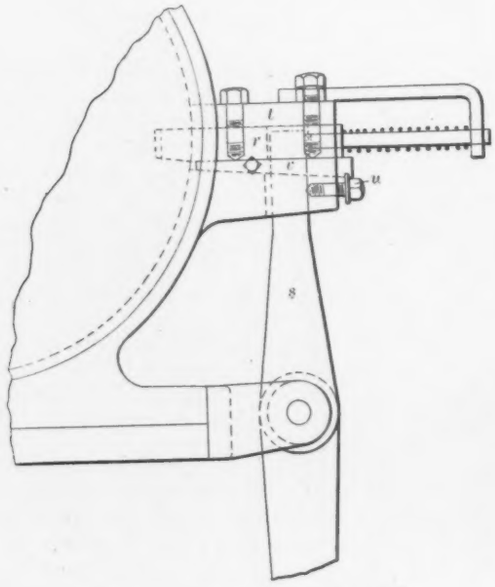


Fig. 3.—Detail of the Locking Pin.

The No. 3 machine illustrated occupies a floor space of 7 ft. 1 in. by 2 ft. 6 in., and weighs, with the countershaft, about 5000 lb. The two smaller machines, Nos. 1 and 2, respectively, measure 4 ft. 6 in. and 6 ft. long, 1ft. 10 in. and 2 ft. 4 in. wide, and weigh 1500 and 3100 lb., including their countershafts.

Great Britain's Production of Open Hearth Steel.

The statistics of production of open hearth steel in Great Britain in 1907 have been gathered by the British Iron Trade Association. The total for the year was 4,663,489 gross tons, as against 4,554,936 tons in 1906 and 3,838,072 tons in 1905. The Bessemer steel statistics have not yet been published, but the open hearth output will probably prove to be as heretofore quite a little more than two-thirds of the total steel production in Great Britain. Unlike the United States, Great Britain produces much more acid than basic open hearth steel. The total of the former last year was 3,384,780 tons and of the latter 1,278,709 tons. The figures for 1906 were 3,378,691 tons and 1,176,245 tons, respectively. For 1905 they were 3,042,834 tons and 795,238 tons, respectively. It will be seen, however, that basic open hearth has made a larger proportionate increase than acid open hearth steel. Some of the principal forms into which the open hearth output of 1907 was rolled are given below, as compared with the production in 1906:

	1907.	1906.
Blooms and billets (marketed as such)	580,961	498,956
Plates and angles	1,769,855	1,734,446
Bars and tin plate bars	950,938	939,087
Steel rails	79,532	94,626
Structural shapes	266,821	198,380

No separate returns are given of the output of open hearth axles, forgings and steel castings. The average number of open hearth furnaces in operation in Great Britain in 1907 was 392, of which 305 produced acid steel and 87 basic steel. Fourteen new furnaces were under construction at the end of 1907 and 107 furnaces were either unemployed or only occasionally employed in the year. In the production of open hearth steel ingots in 1907 but one works exceeded 300,000 tons output, two produced between 200,000 and 300,000 tons, 14 between 100,000 and 200,000 tons and 22 between 50,000 and 100,000 tons. The average output of steel ingots per furnace in 1907 was 11,896 tons.

The New Barnes Drill.

A new design in drill construction is presented in the 20-in. upright drill just brought out by the Barnes Drill Company, Rockford, Ill., which is a completely new organization headed by B. F. Barnes. The substitution of geared speed changes and positive power feeds for the usual cone pulleys and belts constitutes the chief distinguishing feature of this tool. The peculiar disposition of the gear mechanism, which is noteworthy because of its convenience and compactness, suggests "the Knapsack drill" as a good name for the machine. Strength and rigidity are increased by the reinforcing back brace of the frame, which at the same time furnishes support for the drive.

The diagonal shaft carrying the change speed gears is driven from the main shaft through bevel gears. Four changes of speed are obtained without back gears, and may be quickly made by a convenient shifting lever without stopping the drill. Back gears double the range of speed changes. The levers controlling these movements are within easy reach of the operator standing in front of the drill and the required feed and speed changes are made without change of position. The economical advantage of this arrangement is apparent since no time is lost in leaving the work to shift belts.

The spindle is machinery steel, is double splined and ground to size, and is fitted with a special ball thrust bearing of unusual strength. The spindle is counterbalanced, and the nose is extended to bring the drift hole below the sleeve.

The mechanism controlling the feed changes is distinctive in design, and is aimed to increase its utility and efficiency. It provides positive feeds ranging from 0.001 to 0.025 in. per revolution, any of which may be instantly secured while the drill is in motion through the medium of the small index lever directly in front of the operator. An automatic stop is also provided. The star wheel hand feed lever also differs radically from the feed devices heretofore supplied for drill feeds. It operates through a pinion meshing an internal gear, mounted on the cross-spindle which carries the pinion engaging the rack on the spindle sleeve. The effect is a greatly increased leverage. The star wheel also acts as the quick return lever, eliminating the use of a ball handle for that purpose.

Although regularly furnished with a round table, as shown in the illustrations, a square table with oil channel can be substituted when desired. The table is raised and lowered by a screw and miter gears operated by a crank. When the machine is to be used for tapping, reversible and friction pulleys are substituted for the tight and loose pulleys. The drill is designed to drill holes up to 1 in. in steel without back gears, and 1½-in. holes when

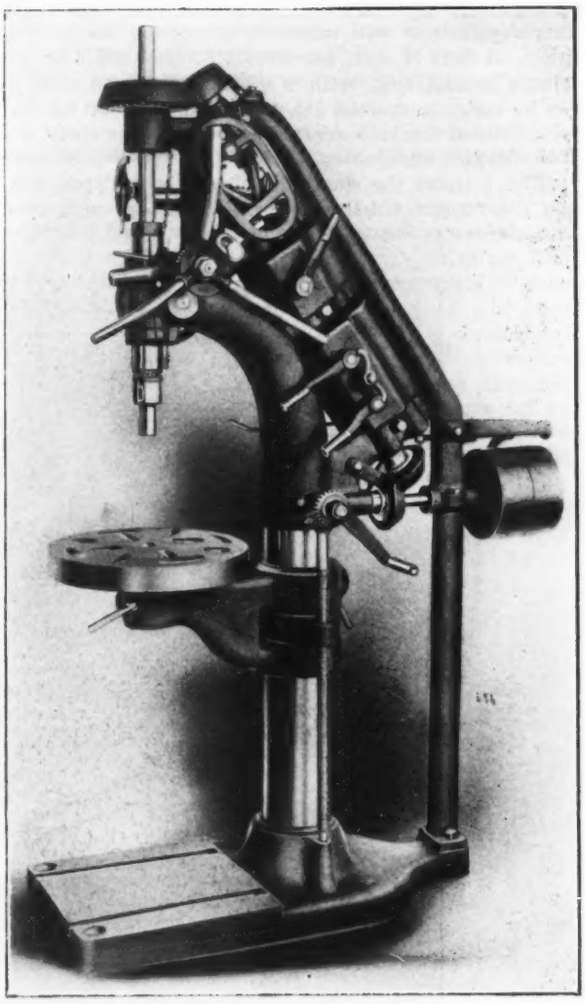


Fig. 1.—The New Upright Drill Built by the Barnes Drill Company, Rockford, Ill., with Complete Equipment.

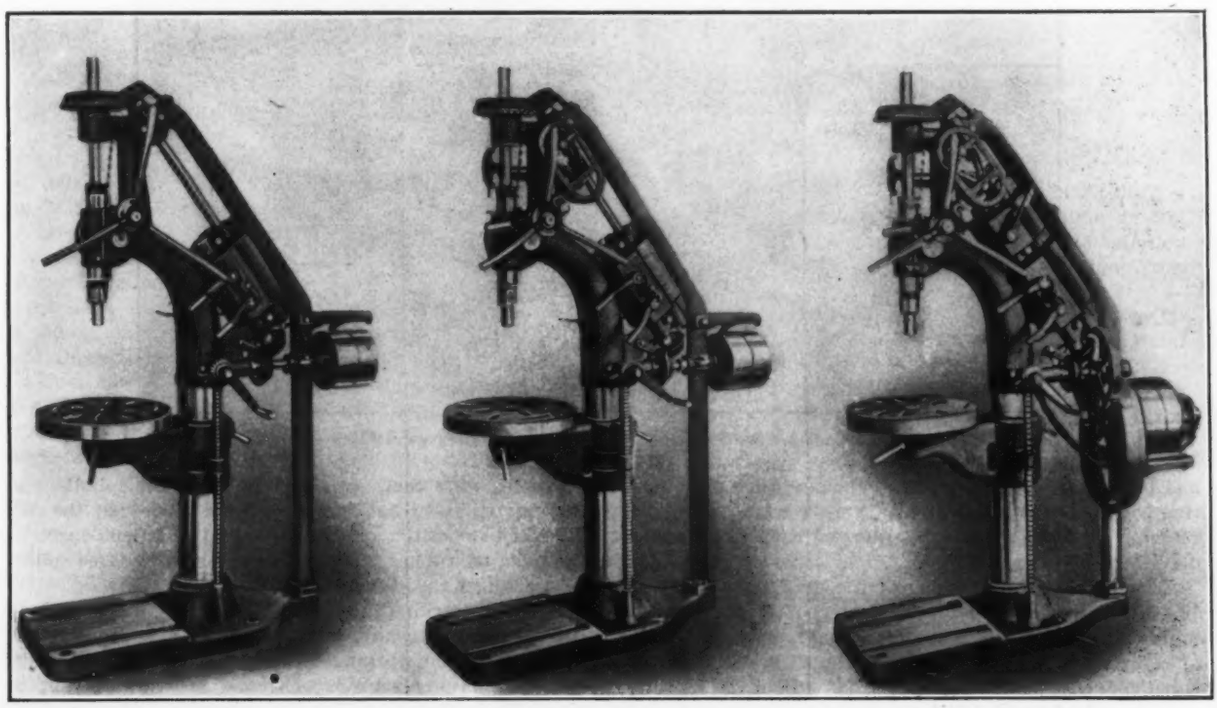


Fig. 2.—The Machine with Plain Wheel Feed and Back Gears.

Fig. 3.—The Same with the Addition of Positive Feed.

Fig. 4.—A Complete Machine Provided with Motor Drive.

VARIOUS WAYS IN WHICH THE NEW BARNES DRILL IS FURNISHED.

back geared. Although not recommended for such heavy duty regularly it will stand the accasional use of 2-in. drills. A feed of 2 in. per minute in steel and 3 in. per minute in cast iron, with 1 in. high speed twist drills can be maintained when the drill is running 190 rev. per min. without the back gears engaged. All the speed and feed changing and driving gears are inclosed in iron cases.

Fig. 1 shows the standard completely equipped drill, and Figs. 2 and 3 drills furnished with part equipment. The machine in Fig. 2 has the plain star wheel lever feed and back geared. The same with the addition of the positive power feed is illustrated in Fig. 3, while Fig. 4 represents the complete machine equipped with geared motor drive.

The principal dimensions of the drill are: Hight, 70 in.; distance from column to center of table, 10¼ in., maximum distance from spindle to base, 42 in.; diameter of column, 5¾ in.; diameter of table, 16 in.; diameter of spindle, 1 7-16 in.; vertical travel of spindle, 10 in.; vertical travel of table, 16 in.; ratio of back gears, 4 to 1 Exclusive of tight and loose pulleys the tool occupies a floor space of 37½ x 16 in., and weighs 680 to 740 lb., according to the equipment.

New Hendey All-Geared Drive Lathes.

The two engine lathes illustrated are equipped with all geared drive heads of different design, and constitute recent additions to the line of the Hendey Machine Company, Torrington, Conn. Fig. 1 is a 20-in. machine, the head of which is exposed in Fig. 2. From a constant speed drive a range of nine feeds are obtained in geometric progression. Three speeds are afforded by the group of sliding gears on the driving shaft meshing individually with their respective gears on the spindle, and thus giving the three highest speeds. Through the medium of two positive clutches operated by a double cam at the front of the head, two different series of three speeds each are had through fast and slow back gears.

In this machine, in common with all others built by the Hendey Company, both speeds of the countershaft are used in the working direction, because the carriage reversing mechanism overcomes the necessity of running the lathe backward, and consequently the nine working speeds are increased to 18, giving a series, in a typical instance, of from 10 to 324 rev. per min. of the spindle. The spindle is started and stopped by means of this con-

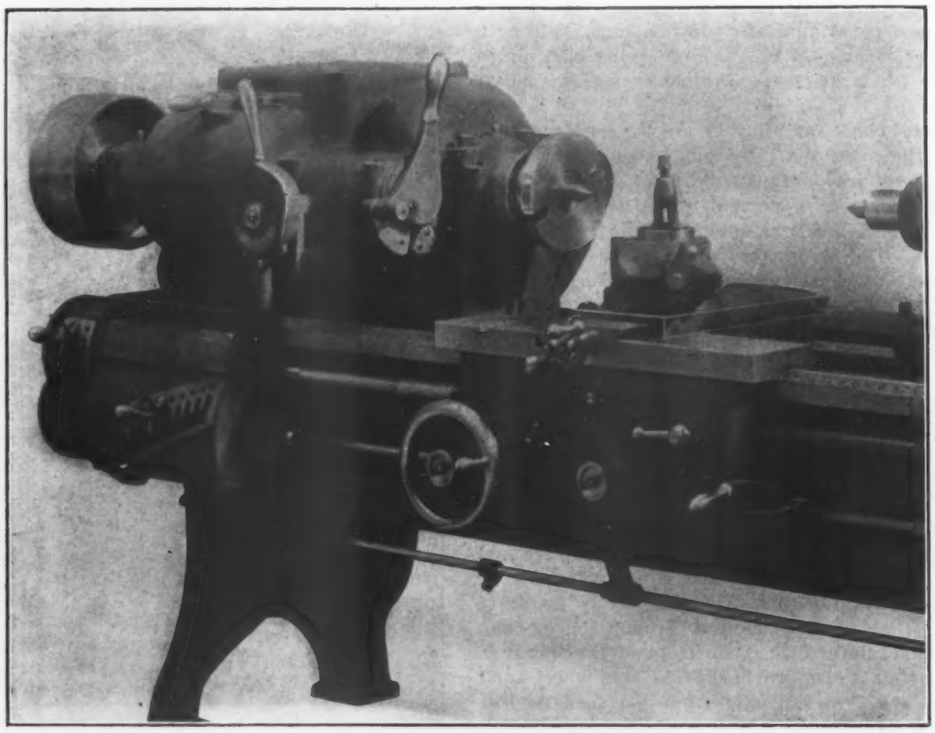


Fig. 1.—A 20-In. Lathe with the New All-Geared Head, Built by the Hendey Machine Company, Torrington, Conn.

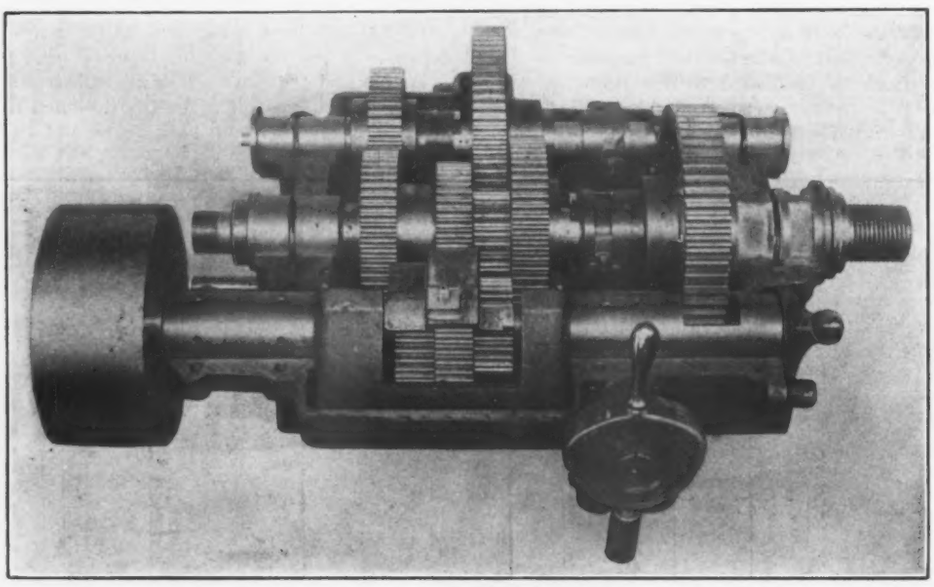


Fig. 2.—The Headstock with Cover Removed, Showing the New All-Geared Drive.

trolling cam, the double cam already mentioned, instead of relying upon the countershaft for the purpose, which means a saving of time when frequent changes of work on lathe centers are called for. The base of the head affords a reservoir for an oil bath to insure smooth running of the gears and lessen their wear.

The driving shaft pulley is 12 in. in diameter, and carries a 5-in. double belt. At the highest spindle speed the belt travels 3.14 ft. to one revolution of the spindle and at the slowest speed 81.5 ft. to one revolution of the spindle. In comparing this effectiveness with a 20-in. cone-pulley lathe, it is found that with the latter in addition to reducing the belt width to 3 in., the respective amounts of belt travel are 1.24 and 37 ft., a difference in belt power of about 4 to 1 in favor of the new drive.

The motor driven 14-in. lathe, Fig. 3, mounted in oil pan, has an all-geared head design differing from that of the 20-in. machine. In this type the rocker gears working on the driving shaft are controlled by a lever operating on the principle of the Hendey-Norton change gear box, having locating notches for the lever and locking holes for the plunger pins. There are four direct speeds and four through backs gears, all in geometric progression, with the driving shaft running at constant speed. The large lever at the front of the head controls a single positive clutch on the main spindle, and is used to stop and start the machine in the same manner as in the 20-in. machine. A variable speed motor is substituted for the countershaft drive, and with its finer graduations of speed through a 20-point controller the operator is able to adjust the speed to within very close limits of the capacity of the cutting tool. Power is transmitted from the motor to the driving shaft through a silent chain and sprockets inclosed in a guard. It will be noted that the motor is solidly mounted direct to the head with no overhang, and may be readily dismounted if occasion should require.

Special attention has been paid to providing ample lubrication of the bearings and gearing. The spindles have taper journals running in annular bearings, and these with the driving shaft and back gear bearings are fitted with ring oilers feeding from oil pockets in the casting. Exceptions are the 20 and 24 in. heads, in which the driving shaft runs in Babbitt lined bearings, formed in each end of the sliding gear cradle or rocker. All bearings of free gearing and clutches in the 20 and 24 in. heads, are oiled automatically from the oil bath already mentioned, while in other sizes the same result is obtained without stopping the machine.

These geared head lathes are built in all sizes from 12 to 24 in., inclusive, in the Hendey-Norton line.

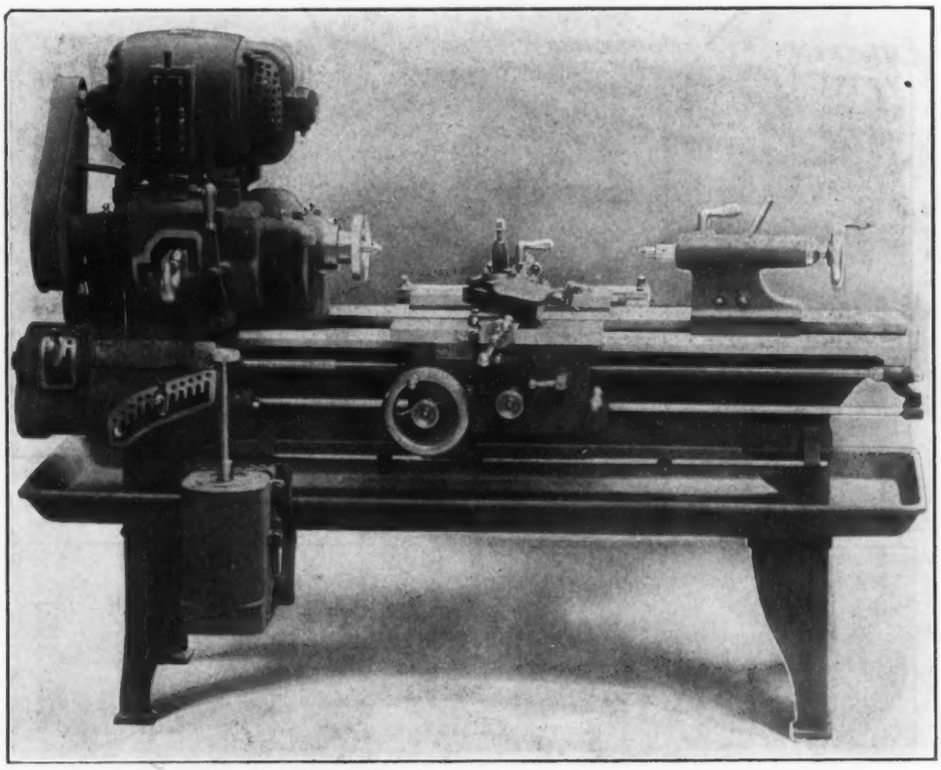


Fig. 3.—A 14-In. Motor Driven Hendey Lathe with Different Type of All-Geared Head.

Turbine Activities in the Far East.

No less than 10 machines, aggregating 25,000 hp., are included in a large shipment of Westinghouse turbo-electric power equipment to the Far East. One of the first machines to be put in service will be a 1500-kw. turbine unit for Manila, to be installed in a station with four other machines of like construction put into service several years ago. Past experience with these machines has resulted in the recent extension. It will be recalled that this railroad system was engineered and constructed by the American engineering firm of J. G. White & Co. Hardly second in importance is the turbine station of the Osaka Electric Company, Osaka, Japan, now building. This will be one of the largest power stations in Japanese territory, and will contain for the present 15,000 kw. in five units. Three of these machines are now being shipped from East Pittsburgh. The remainder will follow as fast as they can be built and tested. The Osaka installation is under direct charge of Takata & Co. of New York and Tokio.

In the strictly manufacturing field, there are two installations in process of erection, one for the Imperial Steel Works of the Japanese Government and the other for the ship yards of the Hakkaido Tanko Steamship Company. Two 500-kw. Westinghouse-Parsons turbo units will comprise an initial installation in each of these plants. This gratifying reception of American motive power machinery in the Far East, especially Japan, may be regarded as an index of future operations where Government inspection is exceedingly rigid and is exercised along lines much more detailed than in this country.

The Chemische Fabrik Griesheim-Elektron of Frankfurt-a-Main, Germany, is introducing the use of magnesium as a deoxidizer in making iron castings, and has shown good results in uniformity of product and increased mechanical qualities. The amount of magnesium added is 0.05 to 0.1 per cent.

The Cincinnati Gear Cutter.

Rigidity, large wearing surfaces and simplicity of parts are regarded as the principal features of the new line of gear cutters now built by the Cincinnati Shaper Company, Cincinnati, Ohio. These are essential to a highly efficient and accurate machine in order to maintain its alignment and prevent cutter chatter. To this end the bed and driving shafts have been made as short as possible, and the shafts of large diameter. Shortening the bed has reduced the weight, but added to the stockiness and rigidity of the machine, and, on account of the design of the cutter carriage, has not reduced its capacity or the length of bearing of the cutter slide on the bed.

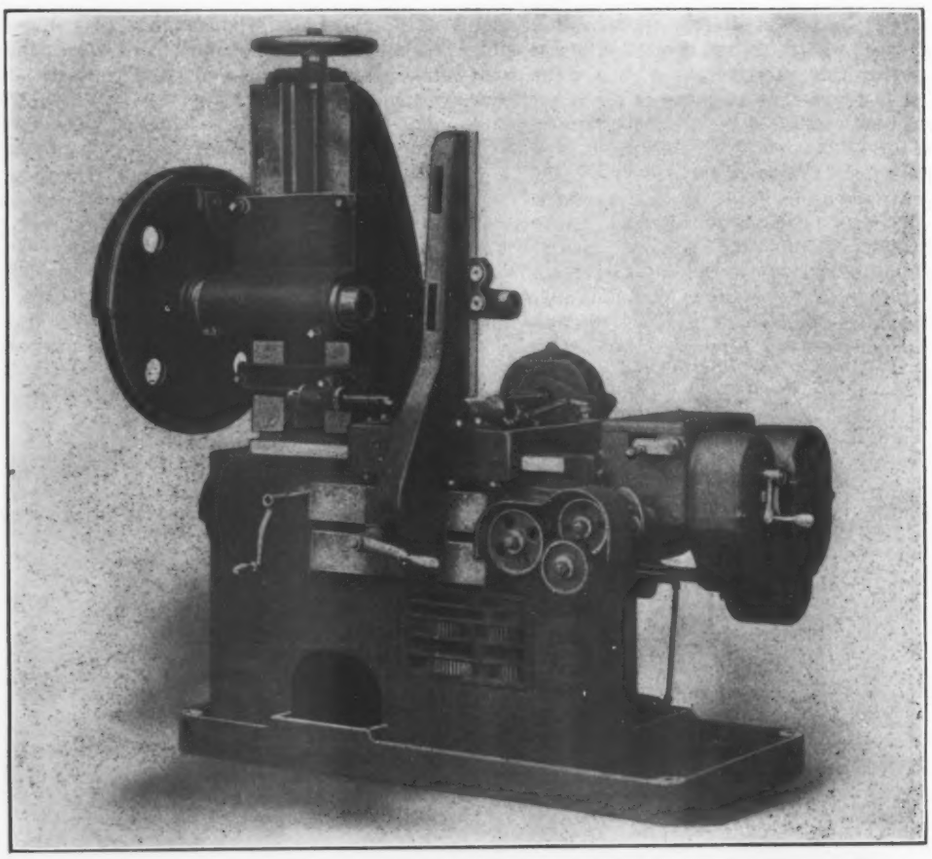


Fig. 1.—The New Gear Cutter Built by the Cincinnati Shaper Company, Cincinnati, Ohio.

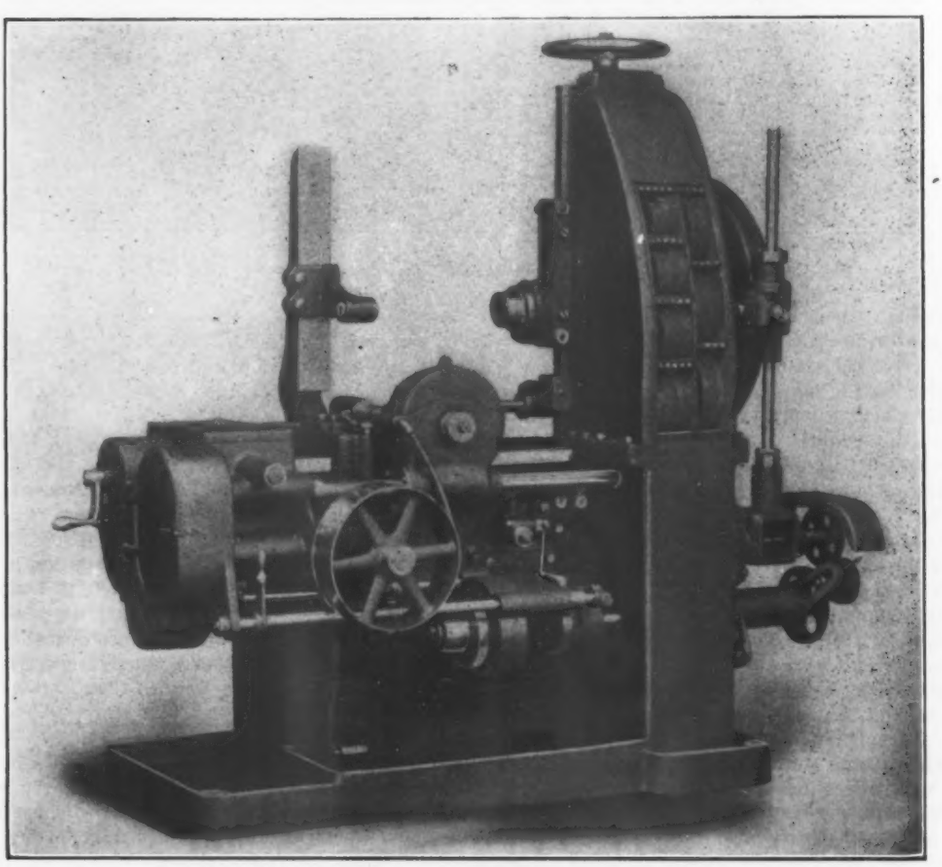


Fig. 2.—A Rear View of the New Cincinnati Gear Cutter.

The guiding surfaces of the cutter slide and work saddle are rectangular, with long and narrow bearings, to lessen the binding action of a wide bearing, and both have full length taper gibs adjustable endwise. All drives are obtained from one constant speed pulley, shown in the rear view, Fig. 2, and the changes of speed and feed are effected by transposing conveniently located gears. The movements are entirely automatic, each being dependent on the preceding one and started only at the completion of that one.

The cutter slide is fed forward and returned through a positive clutch, and the return clutch is cushioned to prevent undue shock. The dogs for limiting the cutter slide travel are adjusted from the working side of the machine, that shown in Fig. 1 by means of a crank; an index plate indicates the direction of movement of the dogs. The construction and working of the dog moving device are particularly unique, and are easily understood from the drawings given in Fig. 3, which include a side elevation, end elevation and plan of the complete machine and detail plan and end elevation of the device.

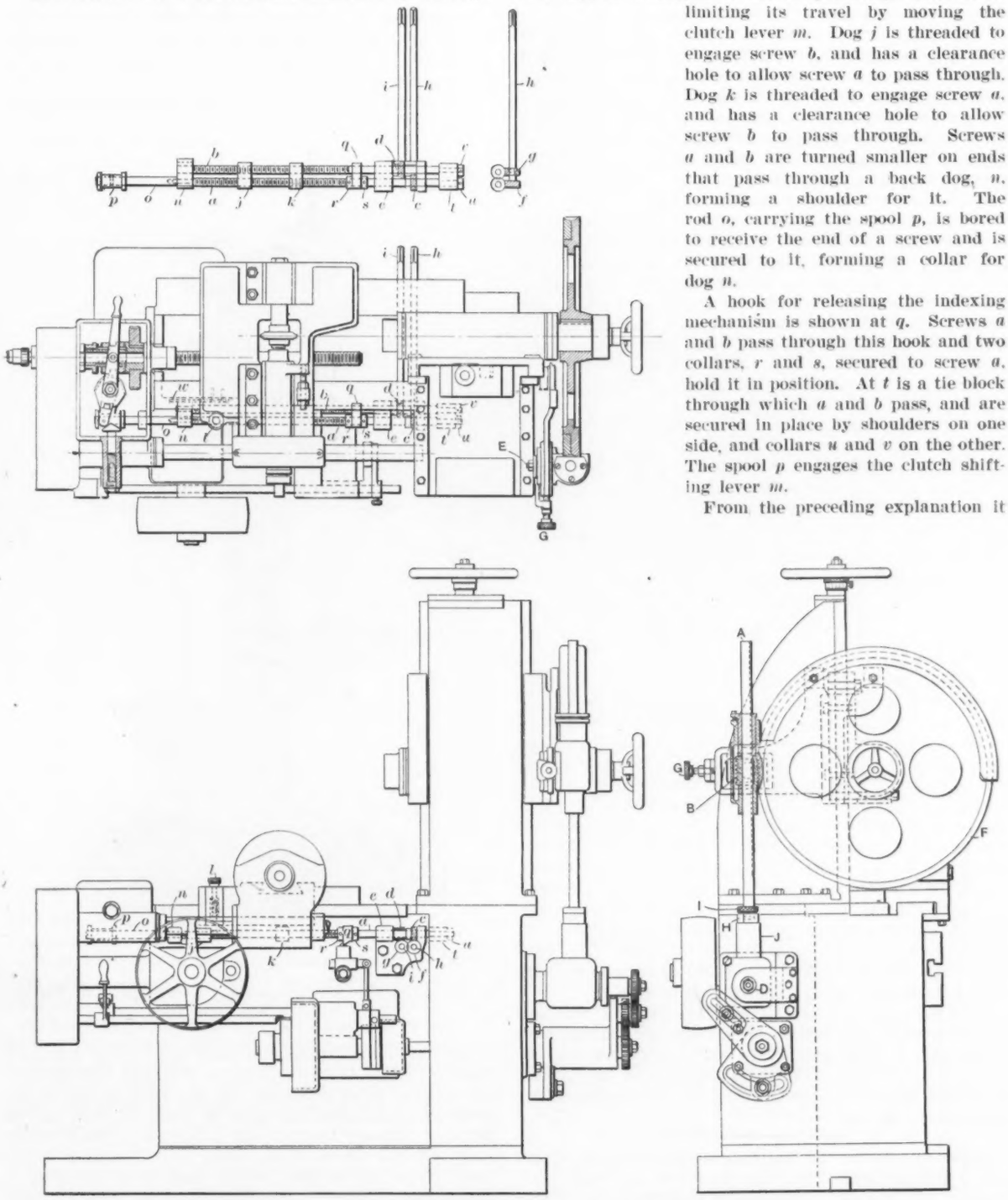


Fig. 3.—Plan and Elevations of the Cincinnati Gear Cutter and a Detail of the Dog Adjusting Device.

Referring to Fig. 3 it will be seen that *a* and *b* are two screws placed parallel with the bed of the machine, and *c* and *d* are spiral gears incased in a bracket, *e*, and meshing two spiral gears, *f* and *g*. Secured to these are two shafts, *h* and *i*, respectively, which are made to fit a crank wrench on one end. Screws *a* and *b* are splined on the ends adjacent to the spirals *c* and *d*, and pass through and are feathered to them, but are free to slide through them lengthwise.

The adjustable dogs are *j* and *k*, and strike a retractable tappet, *l*, secured to the reciprocating cutter slide, limiting its travel by moving the clutch lever *m*. Dog *j* is threaded to engage screw *b*, and has a clearance hole to allow screw *a* to pass through. Dog *k* is threaded to engage screw *a*, and has a clearance hole to allow screw *b* to pass through. Screws *a* and *b* are turned smaller on ends that pass through a back dog, *n*, forming a shoulder for it. The rod *o*, carrying the spool *p*, is bored to receive the end of a screw and is secured to it, forming a collar for dog *n*.

A hook for releasing the indexing mechanism is shown at *q*. Screws *a* and *b* pass through this hook and two collars, *r* and *s*, secured to screw *a*, hold it in position. At *t* is a tie block through which *a* and *b* pass, and are secured in place by shoulders on one side, and collars *u* and *v* on the other. The spool *p* engages the clutch shifting lever *m*.

From the preceding explanation it is seen that when the shaft *i* is rotated by a wrench the screw *b* will be rotated through the spiral *d*, and the dog *j* can be drawn to any position on the screws. Likewise, if shaft *h* be rotated screw *a* will rotate with it, and dog *k* will be moved to any position. When the screws *a* and *b* are rotated, members *n*, *q* and *t* being collared to the screws, do not change their relative positions to the screws lengthwise. The dog *n* rests on a slide, *w*, secured to the bed of the machine to steady the screws. When the cutter slide tappet *l* strikes the dogs the screws will be moved

through the spiral gears in the direction of the cutter slide travel until the clutch lever is reversed, when the cutter slide will move in an opposite direction until the tappet *l* strikes the other dog, and will reverse in a like manner; the amount of travel is regulated by the shafts *h* and *i*. The adjustable dog *j* is made lower than the dogs *n* and *k*, so that the retractable tappet *l* will strike the dog *j* in its lower or normal position, but will clear it in its retracted position and still strike dogs *n* and *k*; the object of this arrangement is to allow the cutter slide to be run back to its extreme position on the bed without changing the setting of the dogs.

The dogs can be easily set before the machine is started by moving the cutter slide to the extreme forward position desired and running dog *k* against the tappet until the reverse lever throws the clutch over to engage the reverse side, and then moving the cutter slide back by hand until the desired back position is obtained, and running dog *j* against the tappet until the clutch is thrown over to engage the feed side. Thereafter the cutter slide will reverse at these positions.

The indexing mechanism is simple and free from complicated parts; it operates without shock, and is easily accessible. This mechanism is so interlocked with the feed screw that the cutter cannot enter the work unless the indexing has been completed. The index worm is disengaged from the wheel in a novel way, dispensing with the extra shaft and two spur gears common to other gear cutters.

By referring to Fig. 3 it will be seen that the splined worm shaft A pases through the index worm B. The box J incloses two miter gears and swivels about the shaft D, and by loosening nut E the worm B can be swung out of mesh with the worm wheel F. The stud G is set for the proper engagement of the worm with the wheel, so that the worm always goes back to the same position. H is a friction, and when loosened the shaft A and the worm can be rotated by the disk I when setting work. The arm for supporting the outer end of the work arbor is clamped to its bearing by a lever, so that it can be quickly loosened and drawn back when putting in and taking out work.

The cutter slide has 10 changes of feed, ranging from 1 to 7¼ in. per minute. Change gears for faster feeds can be furnished if desired. The cutter spindle is journaled in a bronze bearing that is adjustable endwise for centering the cutter to a gauge furnished with the machine. There are six changes of cutter spindle speed, ranging from 28 to 146 rev. per min. Index change gears are furnished to cut all teeth, from 12 to 100, and, with the exception of prime numbers and their multiples, from 100 to 450. Special gears for cutting other numbers of teeth can be had when required. With the machine is included a countershaft having 14 x 4½ in. tight and loose pulleys and intended to run at 280 rev. per min. Instead of the countershaft the machine may be equipped with motor drive, the motor being mounted on an extension to the base. The belt driven machine occupies a floor space of 72 x 38 in. and weighs, including the countershaft, about 4000 lb.

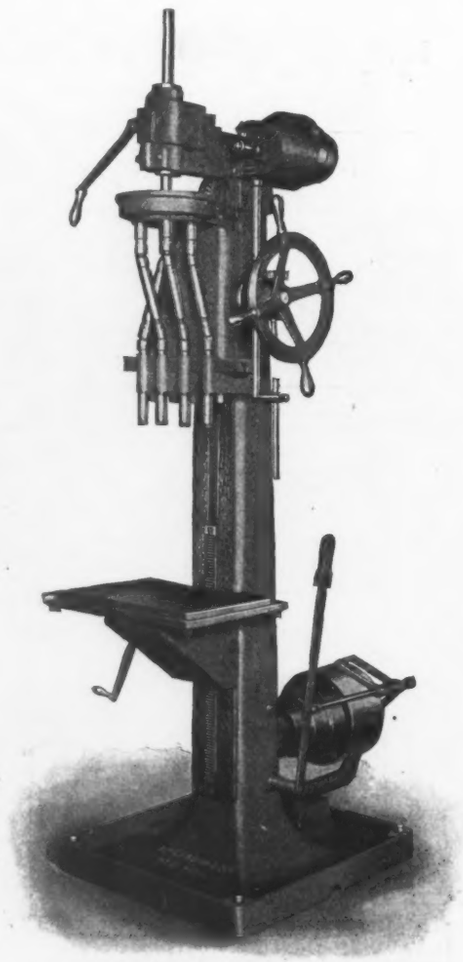
The first machine of this type has been in constant service at the builder's shop for the past six months, and is reported to have given very satisfactory results. It has accurately cut gears of three-pitch in cast iron at the maximum feed of the machine, 7¼ in. per minute, without previous stocking.

Alice Furnace of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has gone out of blast. At present, only five of the merchant blast furnaces in the Mahoning and Shenango valleys are in blast, these being the No. 3 of the Shenango Furnace Company, one stack each of the Youngstown Steel Company and Stewart Iron Company, both running on Bessemer iron; the Girard Iron Company's furnace and one stack of the Andrews & Hitchcock Iron Company, which are running on foundry and gray forge. Dover Furnace, of M. A. Hanna & Co., at Canal Dover, Ohio, recently went in blast. It is probable that Mattie Furnace of the Girard Iron Company, Girard, Ohio, and Midland Furnace of the Midland Steel Company, Beaver, Pa., will be blown out within the next two weeks.

A Gardam Adjustable Multiple Drill.

One of a series of adjustable machines recently designed by William Gardam & Son, 45 Rose street, New York, to take the place, for manufacturing purposes, of the ordinary multiple drilling machines, with fixed spindles now most generally used, is shown in the accompanying engraving. They are substantial machines, adapted for drilling at one time a number of small holes up to ½ in. in the parts of automobiles, automobile accessories, typewriters, electrical devices, hardware products, &c., and the ease with which they may be handled and with which the changes can be made from one series of holes to another, renders them as useful for general work as for long runs.

They are made with a varying number of spindles,



A New Adjustable Multiple Drilling Machine Built by William Gardam & Son, New York.

which have an adjustment forward and back of 3 in. and sideways of 15 in., the minimum distance between any two spindles being ordinarily 1¼ in. Each spindle is capable of adjustment vertically to allow for the use of drills of different lengths, and has a No. 1 Morse taper hole. Chucks can be fitted direct to the spindles if desired. The rail or head which carries the spindles is counterbalanced by a weight within the column. The table is 16 x 12 in., and is supported on a rigid inclosed box knee to insure accuracy in drilling. It is adjustable by rack and pinion, and has an ample working surface surrounded by an oil groove; the size and shape can be adapted to special needs. The knee of the table and head bearings are scraped and provided with gibs to take up wear. The base is made with a rim to prevent overflow of oil, chips, &c.

The countershaft is attached to the base, is fitted with tight and loose pulleys and has self-oiling bearings. The driving gears and spindles are made of carbon steel. The machines can be had with or without direct connected all

gear feed and with or without a tapping attachment. They can easily be adapted for individual motor drive.

These machines are suitable for working in gangs, several of them being mounted on a common base and arranged to work together or independently in groups. When set up in this way one attendant can easily take care of and operate several machines.

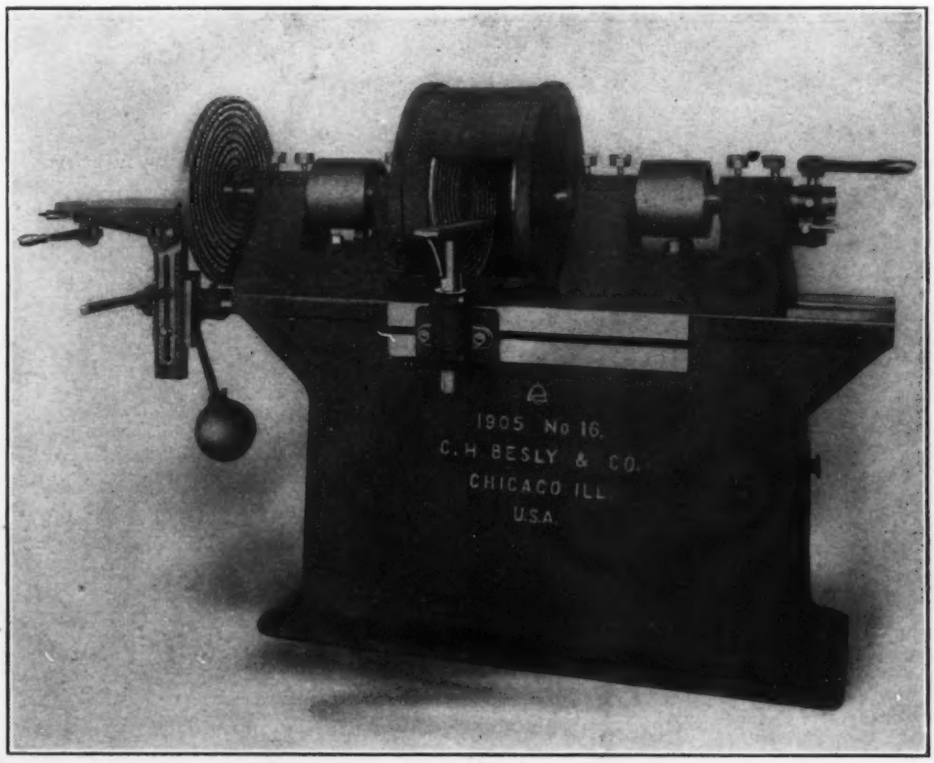
A New Besly Heavy Spiral Disk Grinder.

A heavy, powerful and rigid spiral disk grinder built by Charles H. Besly & Co., Chicago, Ill., is herewith illustrated. It is known as the new 1905 model No. 16, and is one of 60 or more different types built by this company. Good design and proportions as well as strength, rigidity and accuracy were features which it has been sought to embody in this machine.

An important feature is the third disk on the left hand end of the machine. Below this disk is a shaft fitted into the base of the machine, absolutely parallel with spindle, on which the tables are supported. The upper table is a geared lever feed table and is used for a large variety of grinding operations, the top of the table being so designed that jigs and fixtures can be readily attached to it. This table can be made stationary by clamping it to the shaft, or can be oscillated across the face of the disk. The table top can be inclined to an angle of 30 degrees from its horizontal position. The table has a powerful feed mechanism, which is easily operated by a short lever, and is equipped with a micrometer adjusting screw. A very long bearing is provided on the shaft, and the end thrust is taken on collars which are clamped to the shaft and are so constructed that dust or grit cannot get into the bearings.

Another feature of this machine is the telescopic dust hood which covers the gap where the work is inserted between the disks, and opens and closes automatically according to the size or width of the work. The right end of the hood being attached to the movable head is always in position to narrow the opening as the right hand head is moved toward the face of the opposite disk. This hood is hinged at the rear side of the machine so it can be instantly thrown back, giving free access to the disks. The dust pocket in the base of the machine is made tight, so that a suction can be maintained when an exhaust pipe is attached to the rear of the base or up through the floor directly under the base. It is claimed that when an exhaust fan of suitable size is connected to the machine the air surrounding it is kept entirely free from dust. A hood is also provided for the third wheel on the left hand end of the machine. This, however, is not shown in the engraving.

The machine as shown here is equipped with 20-in. diameter spiral disk wheels, 13-16 in. thick. End thrust is taken on hardened and ground steel thrust collars of large area. The spindles are driven by 6-in. belts, with a belt speed of about 3000 ft. per minute, thus insuring ample driving power. The bearings are long and are protected from dust and grit. The bearing bushings are fitted into bored and reamed holes in the heads, thus ensuring perfect alignment, and the bushings when worn out can be easily replaced. The sliding or movable spindle is reciprocated through a rack and pinion by a handle giving a considerable leverage, and is equipped with a micrometer adjusting stop screw. The spindles are of crucible machinery steel, ground all over, and special attention has been given to the lubricating of the spindle bearings. The machine illustrated is equipped with solid oil cups.



The New 1905 Model No. 16 Heavy Spiral Disk Grinder Built by Charles H. Besly & Co., Chicago, Ill.

The heads of this machine are carried on V-ways, to which they are secured by large bolts. Thus when the heads are clamped to the base the whole is securely bound together. On the front of the base is cast a pad, having a tee slot its entire length, on which the work rest bracket is secured or to which any other fixture may be attached. With this machine are furnished 10 work rests of various widths, a countershaft, an assortment of Helmet spiral circles and a setting up press for securing the latter to the machine's disks. Solid wheel chucks can be furnished for this machine if desired. The net weight of this machine and all accessories is 3600 lb.

The Youngstown Car Mfg. Company, Youngstown, Ohio, has received an order from the Bethlehem Steel Company, South Bethlehem, Pa., for six 40,000-lb. steel cars for use in hauling ore on its Cuban property. The Youngstown Company is also building 200 all steel coal mine cars for shipment to the Pittsburgh District. These orders, with others recently taken by the company, will enable it to run its plant full time for at least two months.

WESTINGHOUSE GAS ENGINES.

Notable Development in this Branch Made by the Westinghouse Machine Company.

In the 10 years that the gas engine business has been actively engaged in by the Westinghouse Machine Company, East Pittsburgh, Pa., it has assumed remarkable proportions. There are now in operation or on order 1054 engines, aggregating about 140,000 hp., or an average of 140 hp. per unit, and stock orders bringing the total up to about 160,000 hp. In point of number these are mostly vertical engines, but although those of horizontal type are in the minority, they represent a large part in the total horsepower, the 49 now in operation or ordered totalling 51,000 hp., or over 1000 hp. each. It is with these engines that the present article is principally concerned. They are of the four-cycle tandem double-acting type and constitute probably the most important showing that American design has made in the field in which Germany has so decidedly taken the lead.

Fig. 1.—A View in the Edgar Thomson Works of the Carnegie Steel Company at Bessemer, Pa., Showing a Westinghouse Gas Engine and Direct Connected Generator.

The Westinghouse engines as a whole have gone into all fields, electric railroads, central stations, pumping plants and industrial plants of all kinds, but their relation to the iron and steel industry is particularly interesting because there is perhaps no more important problem facing metallurgical engineers than that of most economically using blast furnace gas. Approximately 25 or 30 per cent. of the gas is required in the hot blast stoves; the remainder is available for power or other purposes.* In many plants this is now burned under boilers to generate steam for the power plant, but to utilize it directly in gas engines means to realize a greater efficiency by cutting out the unavoidable losses in the extra transformation. The thermodynamic efficiency of the process of converting the heat in coal to power through steam boilers and steam engines is less than that through gas producers and gas engines, but even more marked is the advantage when the fuel is already in gaseous form. One of the greatest difficulties has been the proper cleaning of blast furnace gas* to secure satisfactory engine operation, but this seems to be practically overcome in the very effective cleaning apparatus which is now available.

The operation of two or more gas engine driven electric units in parallel is no longer impracticable as a speed regulation within 2½ per cent. from no load to full load is now possible, and the actual cyclic variation is also claimed to be within that of standard Corliss engine practice. The efficiency is largely independent of the size which is an important advantage of gas engines wherever used, since large units are not necessary for the sake of operating economy. Also the efficiency is substantially independent of the kind of gas used, since the weaker gases will stand higher compression. The same type of engine is used with all fuels in spite of their variable calorific value. These include blast furnace gas, oil distillate gas, anthracite and bituminous producer gas, by-product coke oven gas and illuminating gas.

The Westinghouse vertical engines are built in sizes up to 300 hp., and the horizontal engines in from 500 to 4000 hp. sizes. The horizontal engines are all adapted to tandem or twin tandem arrangement. The largest engines so far undertaken are those for the Inland Steel Company at Gary, Ind., which have cylinders 42 in. in diameter by 54 in. stroke. These are blowing engines, and will operate at from 60 to 75 rev. per min. On blast furnace gas these engines are rated at from 2900 to 3000 hp., and on natural gas they would develop 4000 hp. On all Westinghouse engines the guaranteed maximum capacity is 10 per cent. more than the rated capacity, and the actual maximum is claimed to considerably exceed this.

At the Edgar Thomson Works of the Carnegie Steel

* A very comprehensive analysis of the possibilities in this direction was given in *The Iron Age* December 28, 1905, in an article entitled "Electric Power from Blast Furnace Gas," by H. Freyn. Also of interest in this connection are the two articles on "Gas Power Economics, with Special Reference to the Iron and Steel Industry," by F. E. Junge, which appeared April 26 and May 3, 1906.

* This subject was thoroughly treated in *The Iron Age* in two articles, August 20 and September 6, 1906, also by F. E. Junge, on "Cleaning Blast Furnace Gas."

Company, at Bessemer, Pa., there are three horizontal twin tandem gas engines installed. One drives an electric generator and is installed in the power house where it is operated in multiple with Corliss steam engine generator units. Fig. 1 is a view of this unit. The other two are blowing engines, direct connected to Slick air tubs, and are located in a separate building. A view of a similar unit on the erecting floor in the builder's shops is given in Fig. 2, showing the blowing tubs in the foreground. The blowing engines have 38 x 54 in. cylinders, and operate normally at 60 to 75 rev. per min. The electric unit has 40 x 54 in. cylinders, and runs at 75 rev. per min. The capacity depends somewhat upon the richness of the gas. With blast furnace gas it is 2000 hp. for the blowing and 2400 hp. for the electric unit. With natural gas the capacities would be 2500 and 3100 hp., respectively. The Slick air tubs each have a cylinder diameter of 60 in. and a capacity of 25,000 cu. ft. of free air per minute. They work against a blast pressure of 18 lb. normal or 25 lb. maximum. The generator is a direct current 250-volt 1500-kw. machine, with its armature mounted directly on the engine shaft.

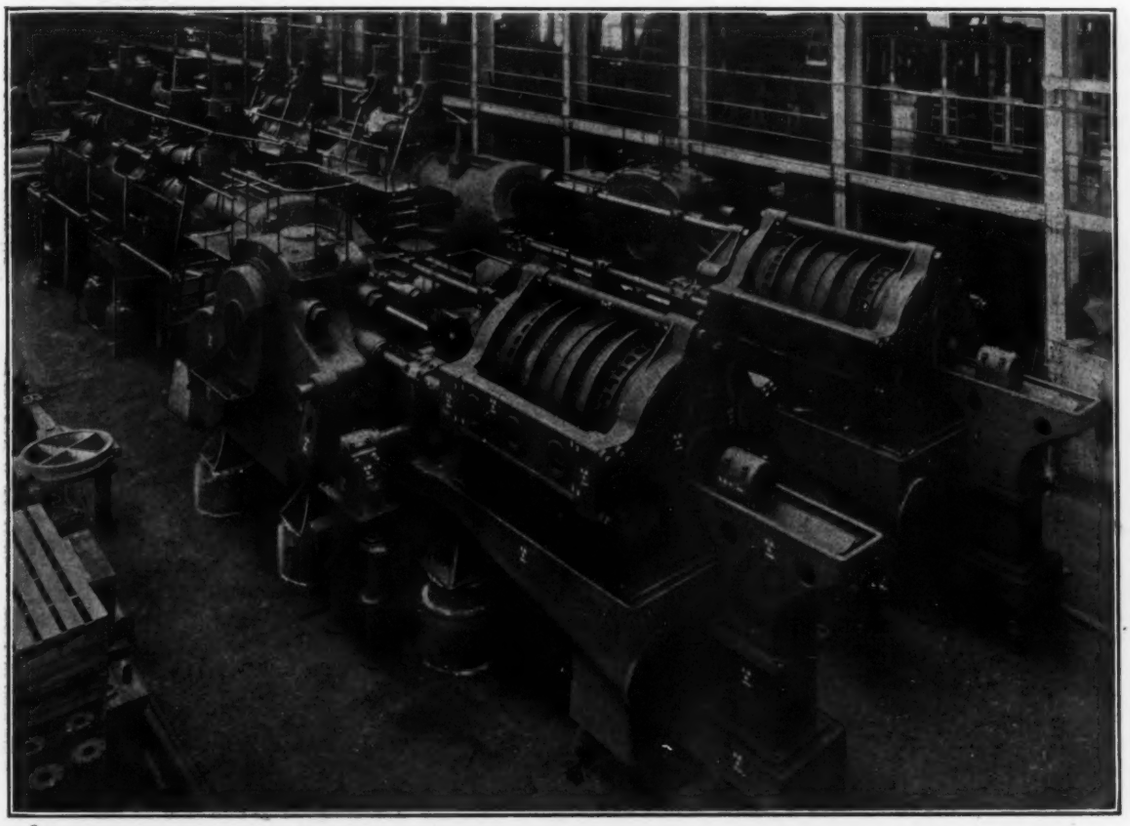


Fig. 2.—A Double Tandem Gas Blowing Engine on the Erecting Floor at the Westinghouse Machine Company, East Pittsburgh, Pa.

The gas fuel is obtained from two or more of the Bessemer group of furnaces. A special cleaning plant is now in service to remove the dust, which can deliver gas to the engines cleaner than the surrounding air. This plant comprises dry dust catchers, vertical wet scrubbers and rotary cleaners, and has proved entirely successful. The composition of the gas is approximately 25 per cent. carbon monoxide, 10 per cent. carbon dioxide, 63 per cent. nitrogen and 2 per cent. hydrogen, and ranges in calorific power from 70 to 100 B.t.u. per cubic foot. It is claimed that, although only about 25 per cent. of this gas is combustible, fully as high an operating efficiency may be obtained as when using natural gas, which is 98 per cent. combustible.

Since the Westinghouse horizontal gas engines are of the four-stroke cycle double-acting type with cylinders in tandem, the single engines have two power strokes each revolution and the double or twin engines four power strokes. Fig. 3 gives end and side elevations of a typical single tandem engine and its foundation. Engines up to about 1000 hp. are mounted above the floor level on pedestals, with space between so that the exhaust valves are accessible from the floor level. For the larger engines a space is also left between the pedestals supporting the cylinder ends, but the engine is mounted flush with the floor and the exhaust valves are reached from the basement floor beneath.

The front housing or main frame is a single box girder casting heavily ribbed to resist the transverse strains imposed by the side crank construction. The box girder completely surrounds the crank pit, forming a rectangular bed which is anchored at the corners. The crosshead may be reached through openings in the side of the housing, and the depression formed by the crank pit serves as an oil well from which the used oil is drained and filtered, to be returned to the lubricating system. The center and rear housings are approximately cylindrical, with the top cut away to expose the crosshead. Two removable steel struts are supplied on the center housings to distribute the strain evenly between the cylinders.

For the smaller engines the cylinders are single symmetrical castings supported at the ends only, but they have only their own weight to carry, since the pistons float, the rods being supported at both ends. There are openings in the jacket walls of the cylinders at the center to avoid shrinkage strains, and a split jacket band fitted with a water tight joint closes this opening, but permits free expansion and contraction of the cylinder. By removing this jacket the water spaces are exposed for cleaning. The cylinders are anchored to the foundations only at the forward end, and slide in machined ways in the center and rear housings to give unrestricted longitudinal expansion with all temperature changes. Through the valve openings access is had to the interior of the cylinder. Compression spaces of variable volume to suit different gases are obtained without altering the design of the cylinder, pistons, or the positions of the valves. The cylinders of the larger engines are cast in halves, divided perpendicularly, and these are securely held together at their ground joints by arrow heads shrunk to bind the flanges together.

Fig. 4 shows one of these cylinders partly assembled. This view also shows well the exhaust discharge at the bottom and the seats for the inlet valves at the top. The openings in the sides of the cylinders are those which receive the ignitors. At the left end of the cylinder may

be seen the short studs which hold the cylinder head and the longer studs which connect the cylinder to the frame.

The side crank construction calls for only two bearings which are easily aligned. These on the smaller engines are composed of three parts and are of the usual engine types. Those of the larger engines are in four parts, two of which are adjustable by wedges. The cap of this bearing instead of having external lips has internal lips, and the housing is tied together by two heavy rods, which put the metal of the housing in compression, hence the thrust on the shaft is distributed equally between both sides of the bearing housings. A large central opening in the bearing cap makes the shaft visible while the engine is rotating. The shafts are solid and have cast steel cranks mounted upon them, having crank pins cast integral to eliminate straining the metal of the crank disk between the pin and shaft by making press fits.

Fig. 5 shows the crankshaft for a double tandem blowing engine, with the flanges or hub plates for the flywheel, the spur gears driving the main lay shaft, and the massive crank disks. The casting of the crank disk and pin in one piece presents something of a problem for the foundry. In the rough it weighs about 18,400 lb., and it must be poured relatively cold. To insure the metal flowing into the parts where the greatest strength is needed it is cast with the crank pin down, and the end of the crank pin is cored with a hollow which seems to insure better structure in the pin. In the casting there is a web extending from the pin to the center of the crank disk to form a runner, which is afterward machined off. This aids the metal reaching the outer end of the pin and gives a solid, perfect casting at that point. A large gate is also provided at the top to give plenty of head of metal to fill all parts of the mold. Roughly the dimensions are: Thickness at the hub, 21½ in.; thickness at the face of the disk, 15 in.; length of crank pin, 16½ in.; diameter of crank pin, 17½ in.; radius from the center of the shaft to the large end of the disk, 44¼ in.

The pistons are continuous symmetrical castings, with no sharp corners to cause preignition. They are centered from the inside to insure uniform thickness of metal at all points. The pistons are permanently mounted on a rod by a pressed fit, and the retaining nut is turned off flush with the piston. The piston rods are bored out and are made in two parts, which are removable front and rear, so that only half the usual building clearance is required to remove the pistons. Sectional metallic rod packings are used, which float on the rods, and the weight of the rod is supported by springs. The packings are water cooled, and receive their oil supply at the center to properly distribute it.

There is perhaps no more interesting feature in the engine than the inlet valves. These are of a design that combines the functions of inlet, mixing and governor valves in a single mechanism. An advantage is that the gas and air are mixed at the point where they enter the cylinder and in quantity only as needed by the engine. Thus quantities of idle mixed gases are avoided and the governor has absolute control of the engine, whereas with one mixing valve for the entire engine a large volume of gas would be involved should preignition occur and the governor would not have such effective control. There is a slight constant movement of the valve mechanism which prevents the governor valve from sticking when the engine runs for a long time under constant load.

The bonnet of the mixing valve contains a closely fitting cast iron sleeve, which slides vertically and is free to revolve on the admission valve stem under the influence of the governor. One set of ports for gas and one for air in this sleeve, register with coresponding openings in the valve bonnet. As the sleeve is reciprocated by the valve mechanism it opens and closes the air and gas ports, and its angular position, controlled by the governor through reach rods, determines the amount of the mixture admitted to the cylinder, but always preserves a constant ratio of air to gas. The mixture at each end of the cylinder is independently controlled by the governor which is believed to give the best possible regulation. It is claimed to be so nearly perfect that no difficulty is experienced in operating 25, 40 or 60 cycle alternaters in parallel.

Fig. 6 shows the centrifugal fly ball governor, the drive of the oil pump which furnishes the oil pressure for the transmission of the governing movements and the reach rod extending toward the valves. The governor is a relay type; that is, its direct control extends only to the oil valve admitting oil to one side or the other of the piston in the oil cylinder. The pressure as controlled by this valve moves the piston giving the rocker arm just in front of the governor an angular movement, which is communicated through a reach rod to other levers and rods leading to the various inlet valves. The governor itself is therefore not affected by the motion of the reach rods nor the force required to move them. To prevent hunting on fluctuating loads the governor is provided with a dash pot. The governor is driven direct from the main shaft at a point near the front of the engine where it is not affected by any twisting movements to which the lay shaft may be subjected.

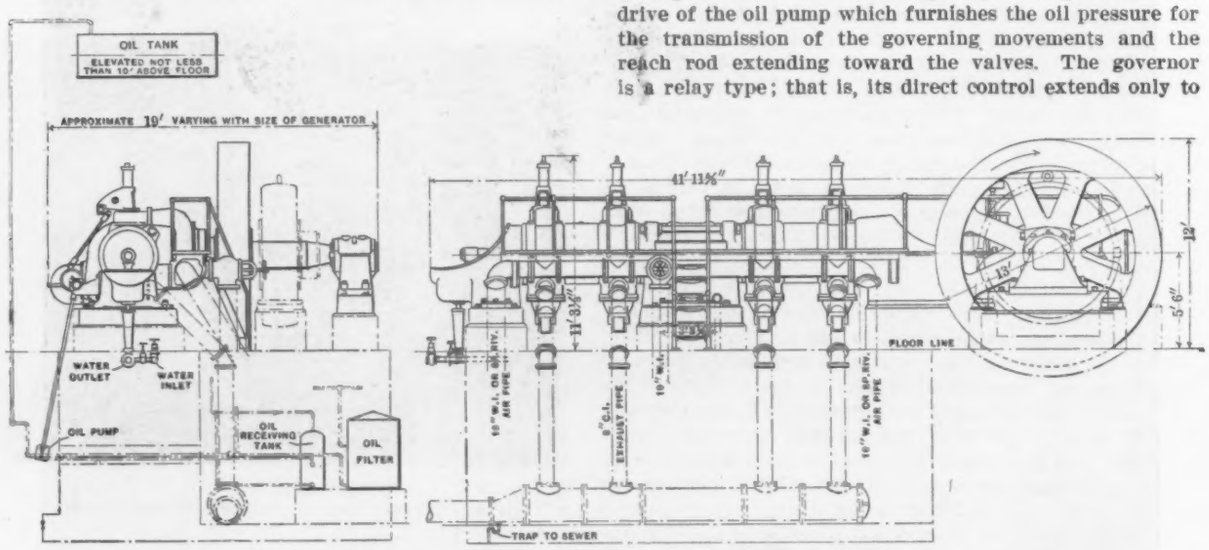


Fig. 3.—End and Side Elevations of a Westinghouse Single Tandem Gas Engine and Its Foundation.

The exhaust valves are hollow and air cooled, and are either cast iron or steel. Cooling water is supplied to the outside of the valves, so that the coolest water is in contact with the valve stem, and the outlet is through a pipe extending to the top of the valve, keeping it always full of water and preventing air pockets. Both the inlet and exhaust valve stems are lubricated at a point above the middle of the valve bushing to insure ample oil over the entire surface.

To allow water jacketing the valve covers and cylinder heads are cast hollow, and are provided with openings to admit cleaning all parts of sediment or scale. Gas tight joints are made at the inner end of the valve covers to expose a minimum surface to the heating action of the burning gases and insure cool valve seats. The location

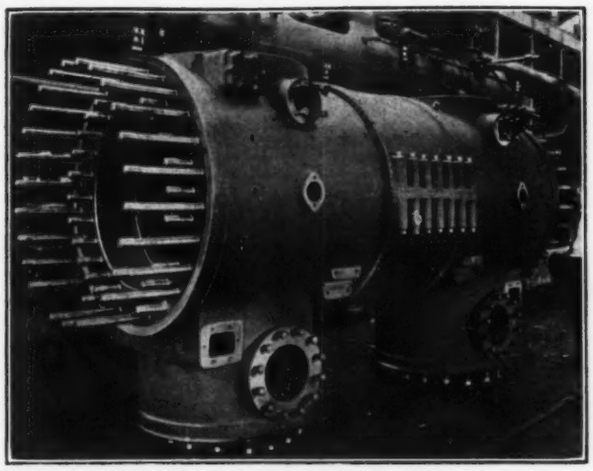


Fig. 4.—A Gas Engine Cylinder Partly Assembled.

of the exhaust and inlet valves diametrically opposite one another on the compression space gives a maximum distance between the two resulting in minimum dilution of the incoming mixture by exhaust gases, more efficient combustion and higher mean effective pressure. It also avoids the heating of the incoming gases by the exhaust parts and materially increases the capacity of the engine.

The gear which operates the inlet and exhaust valves is driven from the main shaft by a spur and bevel geared lay shaft. Spur gearing is used rather than spiral gearing, for the reason that it avoids back lash when the gears are worn, and does away with end thrust. In the latest engines one eccentric at each end of the cylinder is used for operating both the inlet and exhaust valves where formerly a separate eccentric was used for each, as in the engine illustrated in Fig. 1. From the diagrams given in Fig. 7 which were made from the engine in operation it is apparent that a very wide and rapid valve opening is secured. The valve is almost full open throughout the inlet and exhaust strokes which reduces the velocity of the gases and the resistance through the passages in the valves, considerably increasing the capacity of the cylinders. The valve operating mechanism resembles that of the rolling cam type seen on side wheel steamboat engines. An advantage as applied to gas engines is that there is a great leverage when the valve is first opened which relieves the shaft of severe strain, and that rapid closing of the valve is obtained without hammering the valve seats. The faces of the wiper cams are broad and well lubricated to reduce friction and wear.

The simplest and most positive method of instantly cutting off the power of the gas engine, namely, to interrupt the ignitor circuit, has been adopted. The safety stop consists of a spring balanced pin in the rim of the flywheel, which when forced outward by centrifugal force if the speed exceeds a predetermined limit, strikes a pawl that in turn releases a weight attached to a knife switch; the weight falling opens the circuit. Another safety stop may be provided to automatically open the ignitor circuit in case of failure of the jacket water supply. This consists of a diaphragm subjected to the cooling water pressure, which operates a trip releasing the weight when the pressure is reduced.

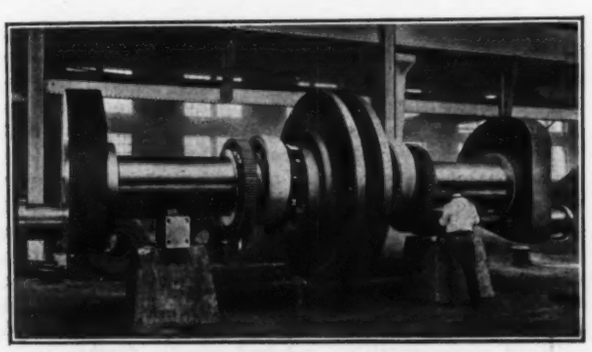


Fig. 5.—The Crank Shaft of a Double Tandem Blowing Engine.

The make-and-break system of ignition has been adopted as the only practical one for engines using gas under high compression. The ignitor contacts are of cast iron or special bronze, which has been found to wear well with the low current required for ignition. No Westinghouse engines are equipped with less than two ignitors, and some have three, equal distances apart around the circumference of each end of the cylinder. The principal benefit is insured reliability, as it is improbable that all will fail to act at any one time, and when all act there is a very material acceleration of flame propagation, so that complete and uniform combustion takes place very promptly. It is stated that an increase in power amounting to about 4 per cent. on the average is obtained by this means. Each ignitor circuit is connected through a small magnetic indicator which gives a visible and audible indication of whether or not the ignitors are operating properly. An ignitor can be removed while the engine is in operation, by first shutting off the gas supply to the affected cylinder and blocking open the exhaust valves.

There are two systems used for operating the ignitors, one of which is mechanical and the other electrical. The mechanical is operated by a second lay shaft gear driven from the main lay shaft and carrying cams which operate the ignitor tripping mechanism. Advancing or retarding the spark is effected by changing the angular relation of the ignitor and main lay shafts, thus gases of varying richness may be provided for. The device consists of a

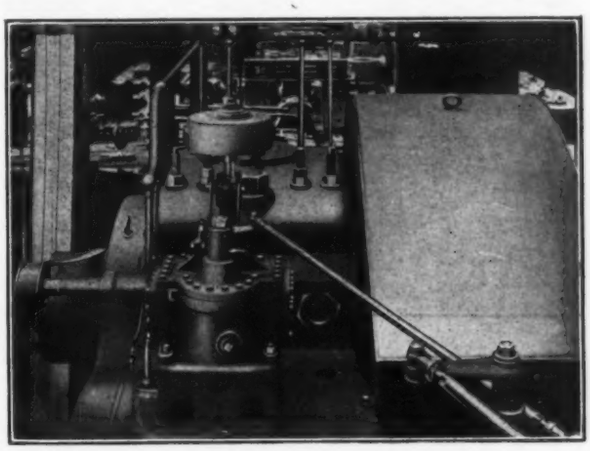


Fig. 6.—The Oil Relay Centrifugal Fly-Ball Governor.

sleeve having internal spiral grooves, which engage pins on the ignitor lay shaft. This sleeve revolves with the ignitor lay shaft, and can be moved backward and forward by a calibrated hand wheel to change its angular position. To avoid advancing or retarding the ignition unintentionally by twisting of the main lay shaft, the ignitor lay shaft is driven from the former at a point near the forward end of the engine.

The electrical ignition gear employs a timer or contactor for making and breaking the ignitor circuit. Instead of the knockoff cams used on the mechanical gear, an electrical knockoff device is employed. One of these is shown in Fig. 8 with case removed. It will be seen to have an S-shaped armature pivoted between two electro magnets, and carrying a hammer which, when the magnets are energized by the contact made in the timer, cause the hammer to strike the ignitor, tripping it and producing the spark in the cylinder. The ignition is easily advanced and retarded, and all the ignitors at one end of a cylinder are bound to operate simultaneously.

Oil for lubricating purposes is obtained from a continuous gravity system, equipped with filters. This embraces all of the bearings, crank pins, crossheads, &c. The cylinders are supplied by timed force feed lubricators, Fig. 9, which delivers oil to four points in each cylinder during the suction stroke only. There are two working strokes at low temperature during which the cylinder oil is distributed over the entire surface of the cylinder. Even distribution is insured, since the pistons do not touch the cylinders at any point; the piston rings form recesses which distribute the oil uniformly. The

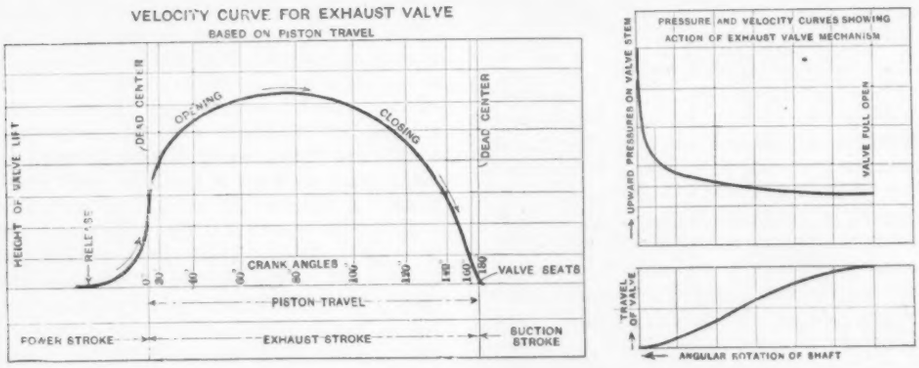


Fig. 7.—Valve Diagrams from a Westinghouse Horizontal Gas Engine.

lubricators are driven by eccentrics on a shaft which is driven through gears from the main lay shaft just beneath it. One valve controls this system so that it is not necessary to disturb the individual adjustment of the lubricators. All important parts of the engine are lubricated through sight feed oilers.

At one end of the lubricator shaft is a coupling con-

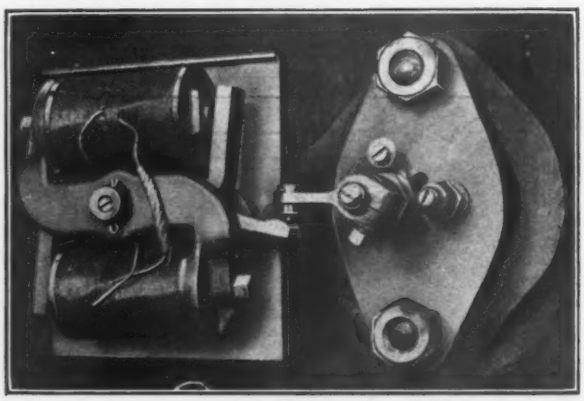


Fig. 8.—The Electrical Knock-off for Actuating the Make-and-Break Ingitor.

necting to the contactor or commutator, which directs the ignition of the various cylinders. To advance or retard the spark the case of the contactor may be revolved by the handle shown, which carries the stationary contacts to positions where they are touched by the revolving contact at later or earlier points in each revolution. Graduations beside the lever, which revolves the contactor case, show the relative positions, and the

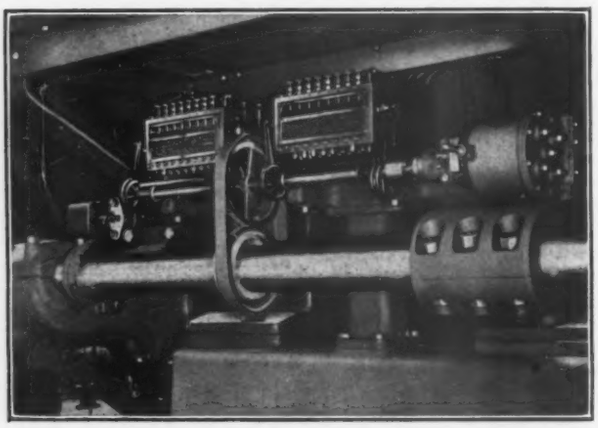


Fig. 9.—The Force-Feed Cylinder Lubricators and Ignitor Timer.

handle at one side locks the setting. At the left of the lubricators may be seen one of the magnetic ignitors.

For starting gas engines of the horizontal type an automatic air starting system is employed. An air supply pipe fitted with an unbalanced poppet valve is connected to each end of each cylinder; each valve is located directly under an air knock-off cam, mounted on the main lay shaft. To start the engine the main air valve is turned on, which causes the poppet valves to close. When one of these valves is held open by the air cam air is admitted to one end of the cylinder causing the engine to turn over. The air is admitted to the cylinder during the power stroke, and the exhaust valves are opened on the succeeding stroke permitting the escape of the air from the cylinder.

A Car Wheel Conference.

A meeting was held at the Waldorf-Astoria, New York, April 21, of the joint committee of the chilled car wheel manufacturers and the Master Car Builders' Association, preliminary to the preparation of a report for the next convention of the latter association. An informal discussion took place of the results obtained from the new M. C. B. type of wheel in the past year, as well as of the general subject of wheel wear and wheel failures. Data were presented by J. E. Muhlfeld, superintendent of motive power of the Baltimore and Ohio Railroad and by A. S. Vogt of Altoona, Pa., mechanical engineer in the motive power department of the Pennsylvania Railroad. It appeared that over 60 per cent. of the removals of wheels in the period covered by the statistics were for flange wear and flange failures. The prospect of relief by the use of steel wheels in heavy service was discussed, and the statement was made that thus far the solid wheels turned out had not sufficiently thick treads to admit of turning; but if this difficulty were removed there was still the considerable item of expense involved in the turning of such wheels, and the maintenance of plant to do this work.

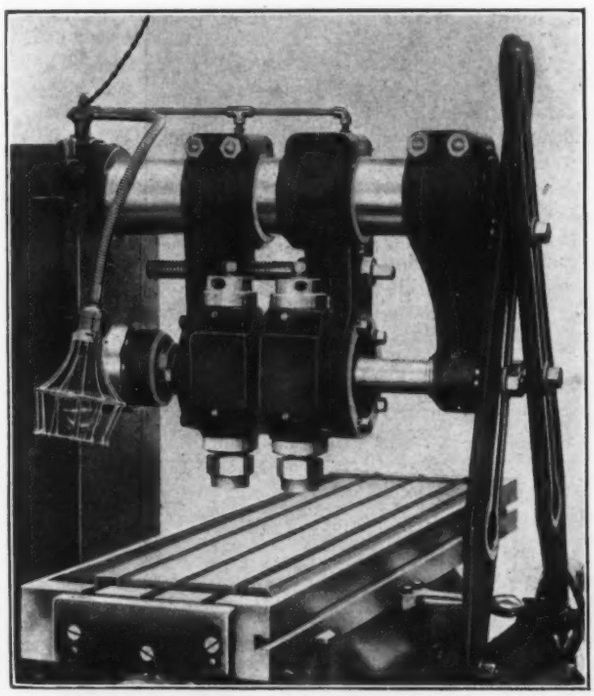
Suggestions for the improvement of the chilled wheel were offered. On behalf of one road a change was advocated in the standard M. C. B. design, so as to permit the use of brackets having a greater curve. On the question of car wheel mixtures it was said that many of the defects of chilled wheels as now made were due to the use of coke pig iron and inferior scrap wheels. Ferromanganese was added to furnish the needed strength to resist the drop and thermal tests, but service results were unsatisfactory. One of the speakers suggested that the more general use of charcoal iron would eliminate the cracks in the tread and flange of car wheels which had been much in evidence in heavy service.

On behalf of the car wheel manufacturers P. H. Griffin made a brief statement. He said that besides the use of proper mixtures there must be knowledge and experience in car wheel manufacture; a fair price for wheels to permit of maintaining a high standard in mixtures and in foundry practice; also a proper attention to conditions of service, with a recognition of the fact that the severer service of to-day requires new practice, and that on the part of the railroads it should mean more than throwing such matters upon the car wheel makers in the effort to impose greater guarantees. Excellent results, the speaker observed, had come from the attention given to wheel questions in joint conferences of the manufacturers and railroad representatives, and undoubtedly further progress would be made by further co-operation.

The Milwaukee Double Vertical Milling Attachment.

An attachment for the horizontal milling machine which the maker of the Milwaukee milling machines, the Kearney & Trecker Company, Milwaukee, Wis., has found very convenient for certain classes of work, is provided with two vertical spindles adjustable in their distance from one another. The illustrations show the general appearance of the attachment and a sectional view of it, and are almost self-explanatory. On an arbor that is inserted in the main spindle are two spiral gears which drive smaller spiral gears on the vertical spindles. The relative sizes of the gears made it possible to make the angle of the spirals favorable to a drive of this kind; it is 54 degrees for the driving gears and 36 degrees for the driven ones.

The work to be milled is held in a chuck or vise on the table and is fed to the left under or between the cutters, or both, as in the cases where the machine is doing the kind of work for which it was particularly designed, the machining of horizontal surfaces with vertical shoulders between them. For this reason the spindles are revolved in opposite directions so that both cutters run against the cut on the vertical shoulders. The adjustability of the spindles is desirable even though the intended function may be the milling of duplicate parts which, for the sake of interchangeability, must have a fixed standard distance between the finished vertical faces, to allow for regrinding the cutters or using cutters of different diameter. This adjustment is provided by the screw shown. The fine adjustment after the machine is once set up amounts to ¼ in., but it is evident that this could be greatly increased by arranging for the spiral

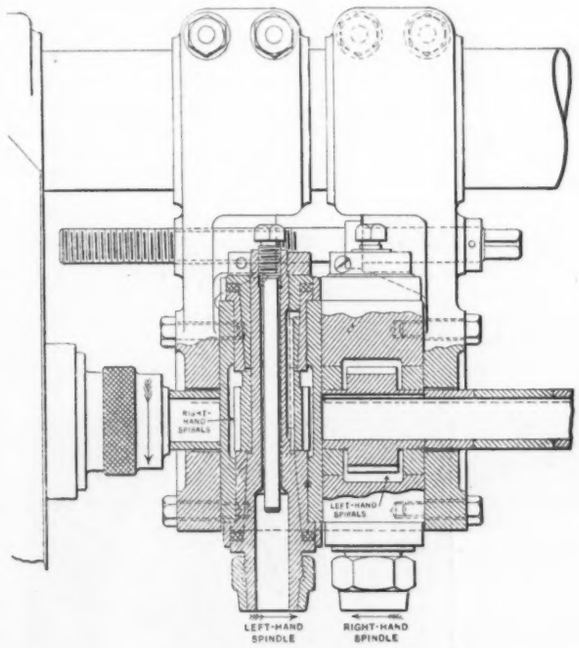


The Milwaukee Double Vertical Milling Attachment Made by the Kearney & Trecker Company, Milwaukee, Wis.

gear on the arbor to take its end thrust against the bearings in the housing instead of against the arbor itself, which would require leaving the arbor without arbor collars.

The castings containing the vertical spindle bearings are made separate from the brackets which are clamped to the overhanging arm, to facilitate setting the spindles square with the top of the table. The cutters and arbors used in these spindles have straight shanks and are backed up by the screws shown extending through the hollow spindles. These permit slight vertical adjustment of one spindle with respect to the other to bring them both on an exact level, or different levels if that should be desired.

It is incidentally interesting to notice in the accompanying half-tone a typical example of the electric lighting fixtures used in the company's shops to provide artificial illumination where it is needed around machine tools. The lamp is supported by a piece of Almond flexible tubing which may be bent to hold it where it is most useful. The tube is attached to the machine in a little casting designed for the purpose. The arrangement has



Sectional View of the Milwaukee Double Vertical Milling Attachment.

been found to be the most satisfactory yet tried to bring the light in the best relation to the work and the cutters.

The United States Reclamation Service.

A recent decision of the Department of the Interior relating to purchases for the United States Reclamation Service is of especial interest to Western manufacturers, inasmuch as it will bring them into closer touch with the extensive requirements of important development projects in charge of this branch of public work. It has been determined after a six months' trial to make the Chicago office of the Reclamation Service, in charge of Engineer E. T. Perkins, the permanent agency for the purchase of material and equipment, and hereafter all requisitions will accordingly be handled and purchases made through this office. About $40,000 a month is being expended for supplies required in the furtherance of the several irrigation and power development projects now under way; these being located in the far West can be served with greater dispatch by shipments from Western points and, as experience has proved, with no loss of economy in price.

Preliminary surveys are now being made on a new project at Engle Dam about 120 miles north of El Paso, Texas, on the Rio Grande River. This work contemplates the expenditure of about $6,000,000, and will necessitate the purchase of 300,000 barrels of cement in addition to a large amount of machinery equipment, including the possible installation of a stone crushing plant.

The Westinghouse Electric & Mfg. Company, Pittsburgh, in addition to securing an order for the equipment of the municipal electric lighting plant at Auckland, one of the principal cities in New Zealand, has been awarded a contract for the power plant of the Takapuna Tramways & Ferry Company. This company is to establish a ferry service from Auckland to O'Neil's Point, across the Bay of Auckland, and an electric traction system from there to Lake Takapuna, a popular local resort.

The Hulett Moving Car Dumper.

In disposing of ore and limestone received at blast furnace plants, it is necessary to handle a great many cars of various sizes and shapes each day during the busy seasons, to provide for immediate needs, and also to accumulate stock for the winter and emergencies. Car dumpers have been used at the larger plants for several years, but these are fixed in one position, usually at one end of the property. The ore or stone from the standard railroad cars is dumped through these car dumpers into transfer cars, which are hauled down the yard, and the ore transferred by the bridges to the stock piles. A simpler system involves the use of a new car dumper on wheels, which combines the function of the transfer cars since it can be moved parallel with the yard until opposite the particular storage pile into which the ore or stone is to be deposited, and there dumped. In connection with these car dumpers the stocking bridge, equipped with an automatic bucket, is still used, and this bridge extends over the car dumper. The car dumper deposits the material on the near side of the pile and the bridge being brought to this point, picks the material up and carries it across, filling up the balance of the stocking space. The bridge is also used to rehandle the material as required. One of these car dumpers, which are built under the Hulett patents by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, has been in operation at the Cambria Steel Company's plant at Johnstown, Pa., for over a year and a half, with marked success, having reduced the cost of handling material.

A new and similar installation has just been completed at the National Tube Company's plant at McKeesport, Pa. The engravings herewith illustrate this machine, Figs. 1, 2 and 3 being views from various sides, and Fig. 4 drawings giving details of the construction. This machine dumps the contents of a car over a wall 10 ft. high. It weighs approximately 650,000 lb. and is operated by direct current of 220 volts. Three motors are used, two of 130 hp. each for the tipple motion and one of 75 hp. for traveling the machine. It has a traveling speed of from 75 to 100 ft. per minute and is capable of handling 175 cars in 10 hr. without crowding.

Two sets of counterweights assist the motor in hoisting and controlling the rotating cradle. One set automatically holds the car in its position on the platen when inverted; the other set tends to lift the platen when it is down and hold it from overturning too far and also tends to pull it back so that the work on the motors is very much reduced. In other words, the machine empty is very nearly counterbalanced, so that the work done by the motors is simply the handling of the car and its contents. The cars are put on the machine by a locomotive which pushes them up a specially constructed approach track having cast steel shoes resting on the railroad track. To prevent shock as the car strikes the approach, the shoe castings extend on the inside below the heads of the rails so as to engage the flanges of the wheels first and lift the treads over the more or less blunt ends of the casting. The grades are such that the locomotive can

Fig. 1.—The Hulett Moving Car Dumper Built by the Wellman-Seaver-Morgan Company for the McKeesport Plant of the National Tube Company.

pass through and over the car dumper when desired.

As a maximum the machine will accommodate cars 50 ft. long, over all, 11½ ft. wide by 12 ft. high; it will also take cars as short as 28 ft., as low as 6½ ft., and as narrow as 9 ft. No adjustment of the clamping mechanism is necessary for various sizes of cars. Steel hopper cars or short gondolas are handled with equal dispatch. In this machine special attention has been paid to the arrangement of blocking and clamping, so that it is practically impossible to damage a car even through carelessness.

The machinery is all mounted in the house on top of the machine, and is easily accessible and protected from the weather. The operator's cage is similarly enclosed. Only one operator is required, and the levers he has to handle are few, as the rotating of the cradle is controlled entirely by electric power both up and coming down. Automatic safety guards in the way of cutouts are provided, so that it is impossible to overtravel the machine in any direction.

The motor for traveling the car dumper to position at the side of the required stock pile is located in the machinery house, and is geared to a horizontal shaft. At the ends of this shaft are bevel gears driving horizontal lateral shafts, each end of which in a similar way, that is, through bevel gears, drives a vertical shaft with universal joint connection which is geared at the bottom to one set of truck wheels at each of the four corners. The weight of the entire machine is distributed on 32 truck wheels. The first main horizontal shaft carries a magnetic brake and is operated after the manner of the traveling shaft of an ordinary overhead crane.

The cradle is dumped by the hoisting mechanism operated from the other two motors shown in the sectional plan of the machinery house. These, together, are geared to a horizontal shaft, carrying a solenoid brake and driving at the center a second horizontal shaft which carries spur gears at each end driving hoisting drums. The ropes from these drums connect to the base of the rounded outer ends of the cradle floor trusses, that is, where the arcs of the circles are tangent with the base of the cradle girders. This has the effect in the dumping of raising the cradle over the center so that for the remainder of the dumping the weight of the loaded car is

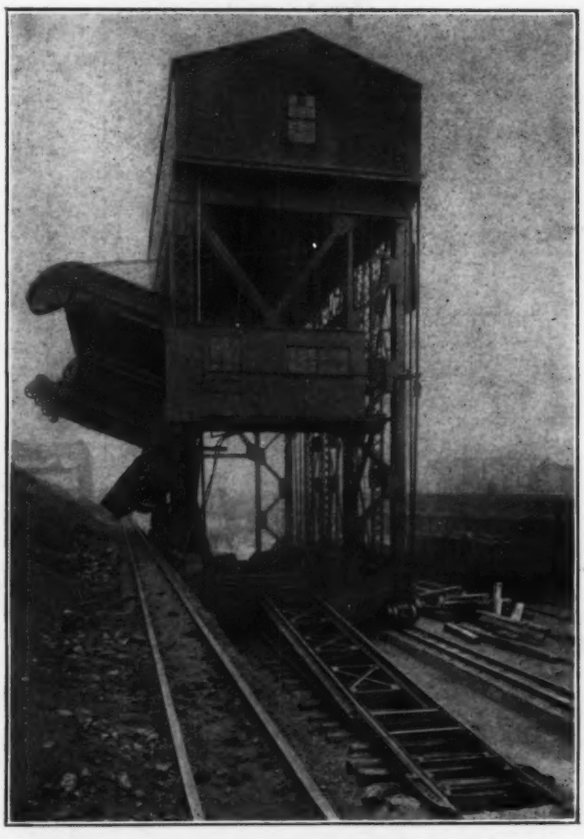


Fig. 2.—End View of the Machine in Dumping Position, Showing One of the Inclined Track Approaches.

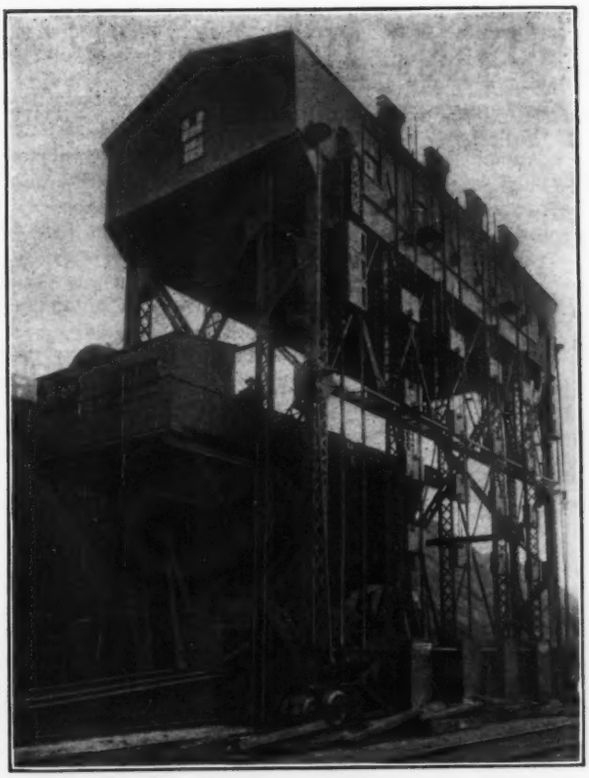


Fig. 3.—A Three-quarter View, Showing the Side Carrying the Counterweights.

sufficient to carry the cradle over to its extreme dumping position, when the drums are allowed to lower slightly. On the return in pulling back, the center of gravity is changed, the load being now discharged, and when the ropes have pulled taut and the drums wound as far as they can the center of gravity is on the opposite side of the line of centers, and the cradle is restored to normal position by reversing the hoisting drums.

The cradle and the car clamps are counterweighted for the condition when there is no car in the machine. The clamp counterweights are arranged to be successively picked up as the weight upon the clamps increases when the car is reversed in position. For example, at the beginning there is only the weight of the clamps themselves to be counterweighted. As the top of the car gradually weighs heavier and heavier upon the clamps one after another of the clamp counterweights is picked up to counterbalance it. The cradle counterweights are those seen at the extreme ends of the framework, and the clamp counterweights the series of four intermediate between the cradle counterweights.

The car platen has lateral motion on rollers to give the car rigid support against the side wall of the cradle while dumping. The car comes to this position—that is, against the side wall without shock as the dumping movement proceeds. A spring and stop restores the platen when the car is returned empty, so that the rails on the platen register with those of the two approaches. Another stop on the opposite side of the platen arrests its travel in that direction when there is no car on the cradle. The spout mounted on the cradle serves to guide the discharging contents of the cars over the separating wall.

It has been stated that the clamps adjust themselves automatically to any size of car. The way in which this is done is interesting, and may be traced out by a little study of the details given in Fig. 4. There are four of these clamps, and since the hights of cars vary the clamps must be supported, so that they will come to a position parallel with the cradle platen anywhere within the distances from the platen corresponding to the maximum and minimum car hights. The clamps therefore have sliding supports at their pivoted ends to allow the required up and down motion. When the dumper receives a car the clamps must be elevated sufficiently to admit it. The outer ends are taken care of by the clamp counterweights, and the inner ends are positively raised by a rope and sheave system when the cradle is brought to

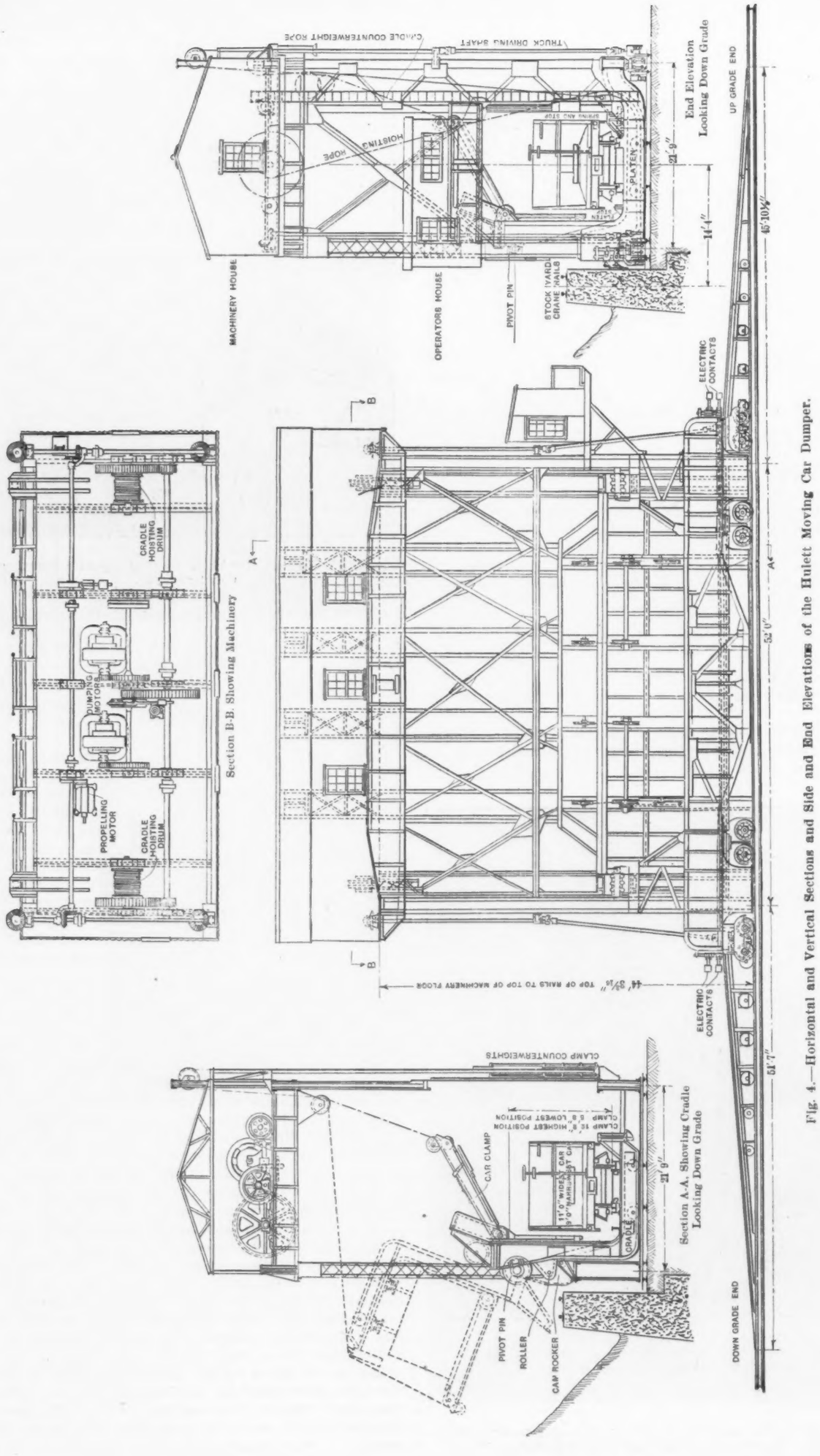


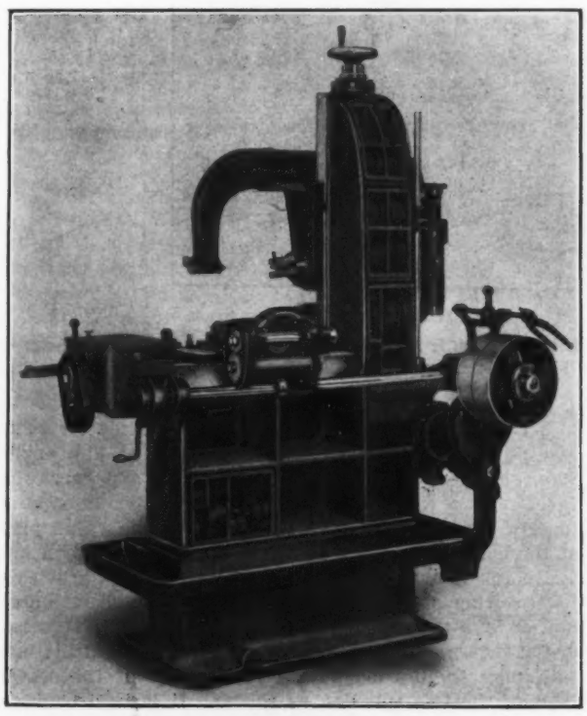
Fig. 4.—Horizontal and Vertical Sections and Side and End Elevations of the Hulett Moving Car Dumper.

normal or receiving position. Ropes supporting the clamp slides pass over pulleys above them and down to a short hoisting shaft, one for each two clamps, and each hoisting shaft is in turn connected by a chain to a cam rocker pivoted on the main frame of the machine. A roller carried by a bracket on the cradle deflects this cam rocker when the cradle is down, drawing taut the chains which lead to the hoisting shafts. As the cradle begins to revolve the roller is withdrawn allowing the inner ends of the clamps to settle into contact with the top of the car by their own weight. When the cradle is revolved through an angle of roughly 60 degrees and before there is any tendency of the car to leave the rails, the clamp counterweights take effect, binding the clamps at both ends securely to the car. Each clamp rope is attached to the cradle on its vertical side below the lowest position of the clamp slide, and then passes over a sheave on the inner end of the clamp and between two sheaves on the outer end which keep the rope in position when the angular direction of the pull changes with the changing position of the cradle. As the cradle is further raised the counterweight rope is drawn tight around the sheaves of both ends of the clamp holding it firmly against the car. The clamps are held in this position until the car has been dumped and has been nearly returned to its normal position. The counterweight ropes first release the outer end of the clamps when the cradle is almost down and just before it comes to rest the rollers on the cradle arms deflect the cam rockers, and the clamp hoisting mechanism draws the inner ends of the clamps to their upper position. The car is then free to be drawn out and another one introduced.

The current supply to the machine is taken from conductor rails mounted one above the other on the concrete retaining wall separating the car dumper tracks from the stock pile. Duplicate sets of shoes carried at the two ends of the dumper make contact with these rails.

The Eberhardt Bros. No. 2-A Gear Cutter.

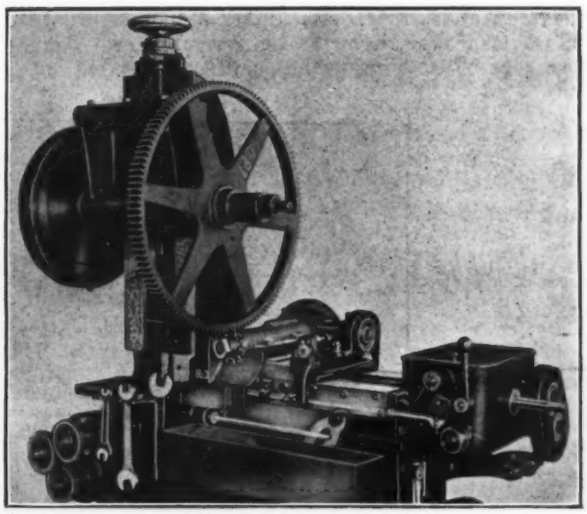
The illustrations herewith show the latest machine which the Eberhardt Brothers Machine Company, Newark, N. J., has placed on the market. It is designed to



Rear View of the No. 2-A Spur Gear Cutter Built by the Eberhardt Brothers Machine Company, Newark, N. J.

cut spur gears only, and is the smallest of the company's line of machines. Primarily it is intended for light and medium work, such as the cutting of change gears used on machine tools, its capacity including up to 8 diametral pitch in steel and 6 in cast iron. In the builder's shop one of these machines is kept running almost continuously on change gears of from 20 to 6 diametral pitch. As the first cost of the machine is moderate, and its operation is entirely automatic, it is considered an economical manufacturing tool.

On most work the overhanging arm is used to support the outer end of the work arbor. On gears over 17 in. in diameter, the arm is not used, and is easily removed. One of the engravings shows a 24-in. diameter gear being cut. The strain of the cut is taken by the rim rest. The work arbor has a taper shank, which fits the taper



The Machine Cutting a 24-In. Gear with the Overhanging Arm Removed.

hole in the steel work spindle. A bolt is provided at the rear of the work spindle for drawing in and forcing out the arbors without hammering.

A pair of centers is furnished, to be used for the frequent jobs where the gear blank is on a lathe mandrel, or a solid pinion is to be cut. As this size machine is used for many odd jobs as well as for manufacturing, it has been a special point in the design and construction to make it easy to set up for any work. The operator can easily set up for any ordinary work within 15 min., and usually in much less time.

The rear view shows the drive very clearly, and shows the tight and loose pulley arrangement which is self-contained on the machine itself. All the movements are entirely positive. The front view is not given, because it is substantially the same as that of the No. 2-B, illustrated in *The Iron Age* June 27, 1907. The principal difference between the two machines is that the No. 2-A, as explained at the outset, cuts only spur gears, while the No. 2-B cuts both spur and bevel gears. The two are of the same size, but the No. 2-B has the swivel slide and an extra slide for setting in and out for different lengths of hubs. It has been found that by omitting the bevel features and giving a longer cutting face that the machine was in demand, where otherwise the bevel gear machine would be too expensive. There are many shops which do not require the bevel slides, and the new machine is offered for such shops.

At the annual meeting of the Standard Roller Bearing Company, Philadelphia, March 25, new officers and several new directors were elected, in view of the transfer of control from Philadelphia to New York interests. The officers are the following: Samuel S. Eveland, president; W. B. Osgood Field and Lenox Smith, vice-presidents; William M. Baldwin, treasurer. The new directors representing New York interests are W. B. Osgood Field, Malcomb D. Sloane, John H. Hammond, Lenox Smith, Henry de Forest Baldwin and Herbert Du Puy. The Philadelphia directors re-elected are John C. Winslow, Edward B. Smith, George H. B. Martin and Samuel S. Eveland.

It was decided to ask the wheel manufacturers to express their views on the question of mixtures and general practice and to hold another meeting of the joint committee in May to discuss the communications received in answer to this request.

Manganese Steel Gears for Electric Traveling Cranes.

Makers of electric traveling cranes, in order to reduce the cost of manufacture, frequently equip the machinery with cut tooth gears and pinions made of gray iron. The experience with such a crane in the shops of one manufacturer, at least, has been rather disastrous, the teeth in the main gear having broken several times. The last breakage of teeth resulted in putting the crane out of service for some weeks until a portion of the crane could be rebuilt and steel gears applied. But the severe service caused even the steel gears to wear rapidly, and failures became frequent, due to the worn teeth.

A material has been found, however, manufactured in this form exclusively by the Atha Steel Casting Company, Newark, N. J., which will give greater life. The shops referred to above have been equipping all their cranes with manganese steel gears and pinions, and these are wearing fully five times as long as cut tooth gears and pinions made of another grade of steel. This means a great saving in locomotive and car shops equipped with overhead electric traveling cranes. It also applies to steel mills, foundries and factories using heavy machinery of any kind where gears are used. Not only have the manganese steel gears and pinions been found economical for this class of service, but they have demonstrated great economy in electric railroad service as motor gears and pinions.

The Becker-Brainard Horizontal Milling Attachment.

The scope of application of the vertical milling machine built by the Becker-Brainard Milling Machine Company, Hyde Park, Mass., has been increased by the horizontal attachment which the company has recently brought out. With it the machine is capable of cutting worms and worm gears, spirals, hobs and racks, as well as general work, such as would ordinarily be done on a horizontal machine. The attachment is fastened by bolts in T-slots to the lower end of the sliding head, concentric with the spindle, as shown in Fig. 1.

From the detail of the attachment given in Fig. 2, it will be seen to consist of two principal parts, the upper of which is stationary, while the lower may be revolved in a horizontal plane; graduations at *f* provide for accurate adjustment of the horizontal spindle to any angle. This spindle is supported at both ends, and carries a bevel gear, *a*, which is driven by a gear, *b*, mounted on a tapered stem inserted in the vertical spindle. End play of the horizontal spindle is taken up at one end by a nut and check nut, while at the other end there is provision for securing a cutter, *c*, either by a key and clamping nut, or by a taper shank arbor inserted in end. A cutter, *d*, for general use, but more particularly for cutting spirals, may be inserted at the intersection of the center lines of the two spindles, as shown. It is held between two nuts, one of which, *e*, is graduated so that adjustment having been made for any thickness of cutter, it may be duplicated for the same cutter.

The No. 6 vertical miller shown in Fig. 1 illustrates the practical application of a horizontal attachment of slightly different construction but of the same principle. It is cutting the axial buckets in a Sturtevant steam tur-

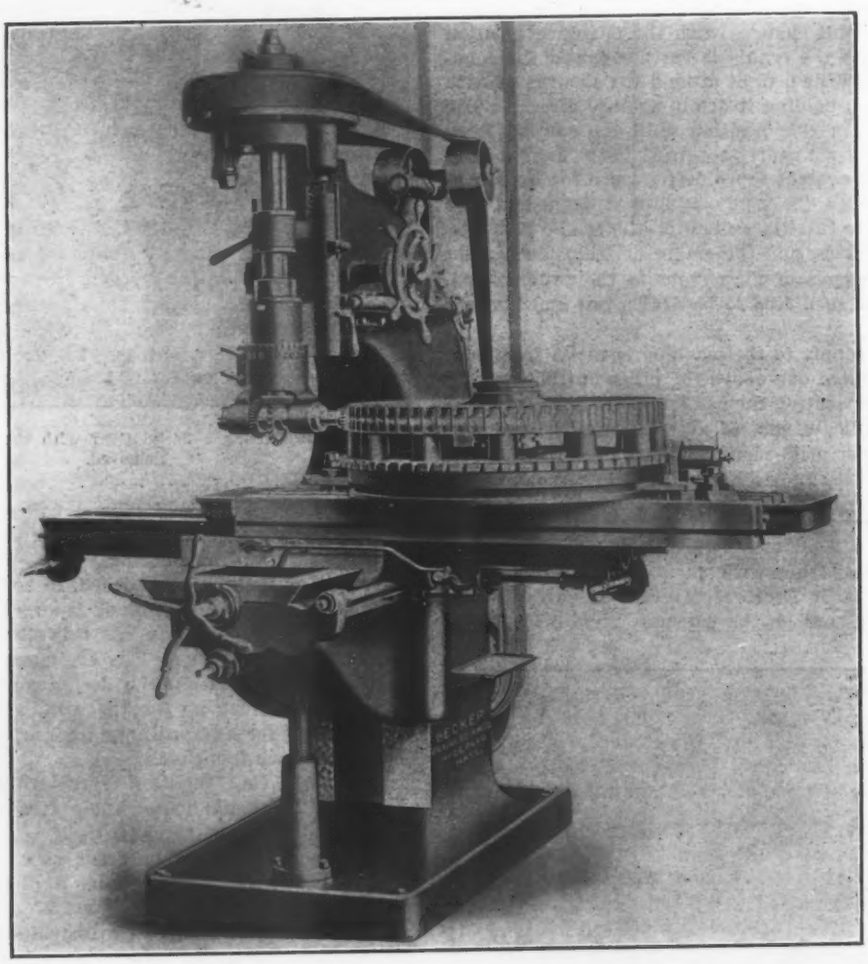


Fig. 1.—The No. 6 Vertical Milling Machine Built by the Becker-Brainard Milling Machine Company, Hyde Park, Mass., Equipped with the New Horizontal Milling Attachment.

bine disk,* which is mounted upon and clamped to a circular slotted edge jig plate that revolves freely about a pin projecting from a circular base plate clamped to the platen. The diameter of the pin is the same as that of the turbine shaft, while the slots in the jig plate correspond in number and spacing to the buckets to be milled in the disk. A spring pawl or pin holds the ring in place,

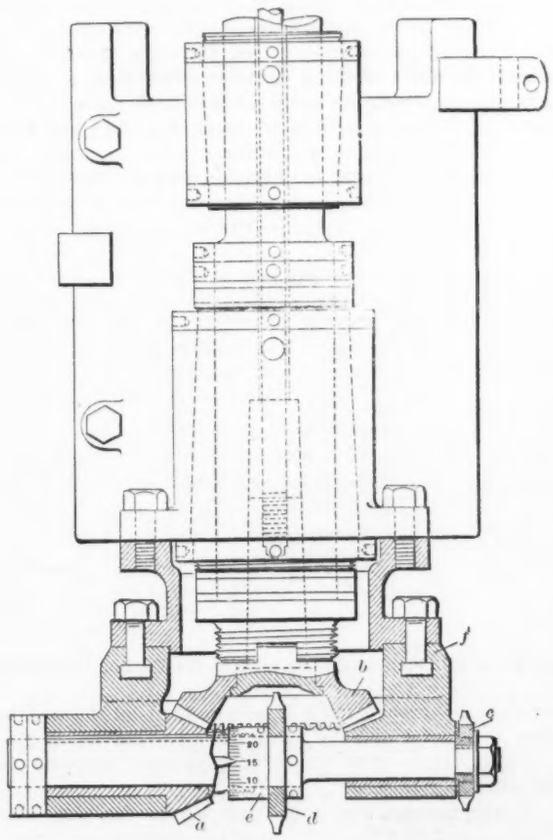


Fig. 2.—Detail of the Becker-Brainard Horizontal Milling Attachment.

while each bucket is being milled. Ample room for the work is provided because of the great distance between the neck of the machine and the center of the vertical spindle, in which particular this type of machine has an advantage on many kinds of horizontal milling.

The Zimmerman Steel Company.—This company, successor to the Monarch Grubber Company, Lone Tree, Iowa, has recently added to its works a complete steel making plant, with a capacity of about 3 tons to a heat for making crucible steel castings. This is said to be the only steel plant of the kind in the State of Iowa, and its product is largely used in the manufacture of parts for the Monarch grubbing machine, scales, feed grinders, &c., made by the company. It is the intention of the company to make a regular line of farm scales out of all crucible steel, except the frame, which will be of rolled material. Starting with a purely local demand, the Monarch grubbing machines are now being shipped not only to every part of this country, but to foreign countries as well. The company is represented by branches in the leading cities of the United States and in Mexico, Porto Rico, Chile, Austria, Columbia and Argentina. The company is officered, and its business managed by Mr. Zimmerman and his five sons.

The N. C. Davison Company, representing the Riverside Engine Company, Oil City, Pa., has moved its offices from the Empire Building, Pittsburgh, to larger quarters in Rooms 1710-1711 Keenan Building.

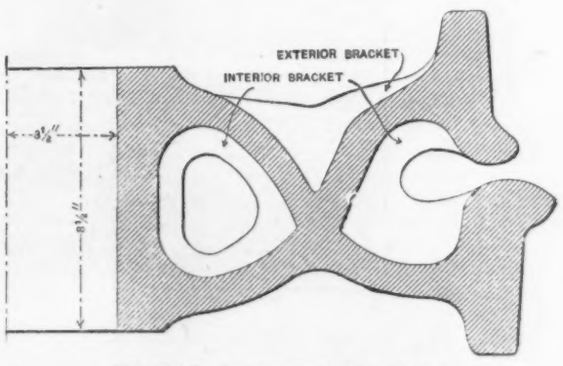
* In connection with this illustration it may be interesting to refer to Fig. 2 of the article, "The Sturtevant Steam Turbine," in *The Iron Age*, October 31, 1907, which shows a vertical Becker-Brainard milling machine cutting buckets in the side of a different type of turbine wheel.

A Double Tread Car Wheel.

A new type of chilled car wheel has been invented by P. H. Griffin, Buffalo, N. Y., in which a second or inner chilled tread is provided upon which brake applications are made, thus relieving the outer tread of the severe wear and damage due to excessive friction and heating from brake service. The new tread is slightly smaller than the present one and is connected with the body of the wheel in exactly the same manner as the outer tread. The line section and curvatures of the inner tread being the same as those of the outer tread no new conditions arise relative to efficiency or the result of brake applications. The inventor argues that by removing the friction of the brakes from the load bearing tread the life of the latter will be much increased, and relief will be obtained from the defects caused by the severe heating of the part of the wheel upon which safety depends. It is stated that the new wheels can be used for centers for steel tired wheels in passenger service with equally good results. While the standard section of 33-in. chilled wheel weighing 700 lb., as now used by the railroads, seems to have sufficient strength in the body, even for service under 50-ton cars, there has been an increasing number of failures of wheels in heavy service because of troubles with tread and flange. These arise largely from severe braking friction.

It is stated that foundry practice in the manufacture of the double tread wheel would not be much more difficult than with the present single tread wheel, the division between the treads being made with a pan core in the way employed for the division of the double plates for the ordinary type of wheel. In the case of a 700-lb. standard wheel it is estimated that the inner tread would add about 200 lb. to the weight of the wheel. While this means additional cost it also means increased scrap value. The accompanying illustration shows a flange on the inner tread to keep the brake shoe from touching the other flange, but the wheel may be made without the second flange.

The Griffin Double Tread Car Wheel Company, Buffalo, N. Y., has been incorporated with a capital of $200,000 to introduce the manufacture and use of the double tread wheel. The company will have its general



The Griffin Double Tread Car Wheel.

office in Buffalo, but does not contemplate the manufacture of the double tread wheel. For the present the company will confine its operations to making arrangements with railroads and chilled car wheel makers by which this wheel can be readily obtained. It requires from 15,000 to 20,000 new wheels a day to maintain repairs in the United States alone, and since by the advent of the 50-ton car, wheel failures have been increased greatly, the new company considers that it has a large field for operation. The officers of the company are the following: Henry F. Griffin, president; C. W. Cuthell, treasurer, and W. A. Griffin, secretary.

The Upson Nut Company, Cleveland, will greatly improve its River blast furnace property by the erection of a 900-ft. reinforced concrete dock along the river front. The contract has been awarded to the Great Lakes Dredge & Dock Company.

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From the detail of the attachment given in Fig. 2, it will be seen to consist of two principal parts, the upper of which is stationary, while the lower may be revolved in a horizontal plane; graduations at *f* provide for accurate adjustment of the horizontal spindle to any angle. This spindle is supported at both ends, and carries a bevel gear, *a*, which is driven by a gear, *b*, mounted on a tapered stem inserted in the vertical spindle. End play of the horizontal spindle is taken up at one end by a nut and check nut, while at the other end there is provision for securing a cutter, *c*, either by a key and clamping nut, or by a taper shank arbor inserted in end. A cutter, *d*, for general use, but more particularly for cutting spirals, may be inserted at the intersection of the center lines of the two spindles, as shown. It is held between two nuts, one of which, *e*, is graduated so that adjustment having been made for any thickness of cutter, it may be duplicated for the same cutter.

The No. 6 vertical miller shown in Fig. 1 illustrates the practical application of a horizontal attachment of slightly different construction but of the same principle. It is cutting the axial buckets in a Sturtevant steam tur-

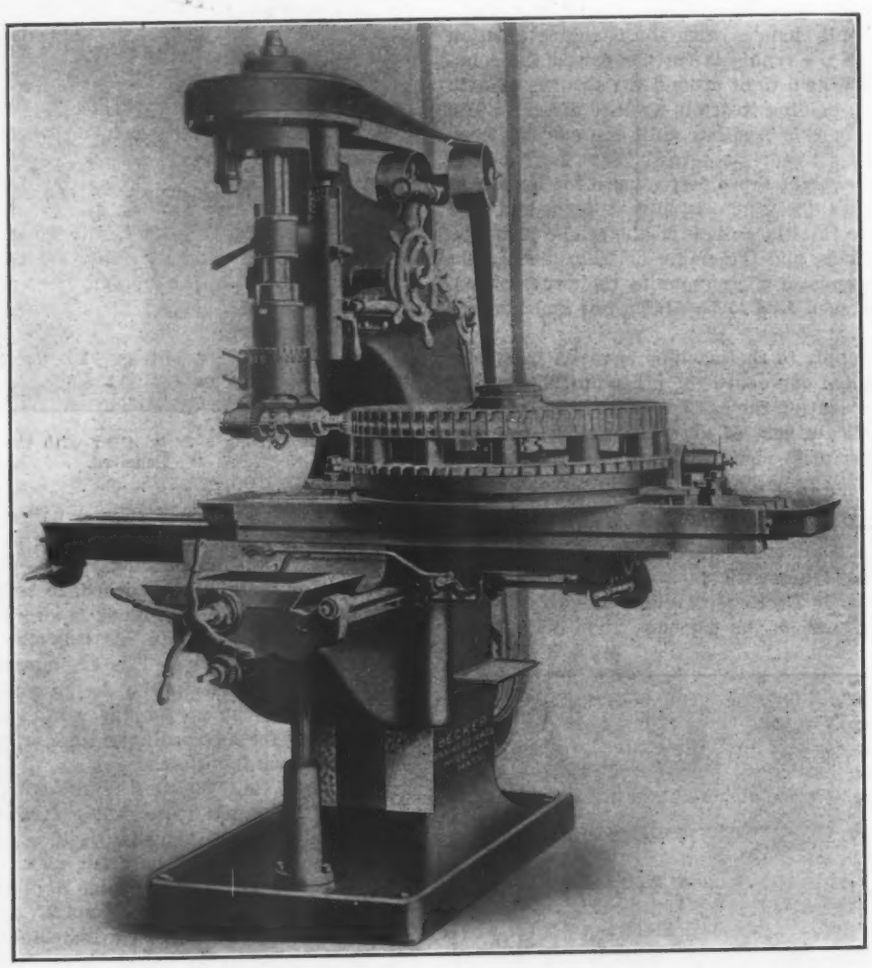


Fig. 1.—The No. 6 Vertical Milling Machine Built by the Becker-Brainard Milling Machine Company, Hyde Park, Mass., Equipped with the New Horizontal Milling Attachment.

bine disk,* which is mounted upon and clamped to a circular slotted edge jig plate that revolves freely about a pin projecting from a circular base plate clamped to the platen. The diameter of the pin is the same as that of the turbine shaft, while the slots in the jig plate correspond in number and spacing to the buckets to be milled in the disk. A spring pawl or pin holds the ring in place,

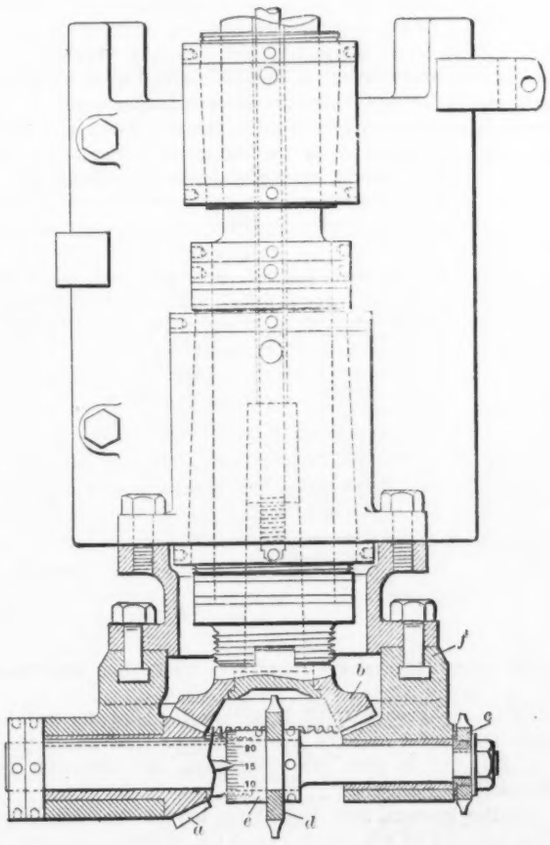


Fig. 2.—Detail of the Becker-Brainard Horizontal Milling Attachment.

while each bucket is being milled. Ample room for the work is provided because of the great distance between the neck of the machine and the center of the vertical spindle, in which particular this type of machine has an advantage on many kinds of horizontal milling.

The Zimmerman Steel Company.—This company, successor to the Monarch Grubber Company, Lone Tree, Iowa, has recently added to its works a complete steel making plant, with a capacity of about 3 tons to a heat for making crucible steel castings. This is said to be the only steel plant of the kind in the State of Iowa, and its product is largely used in the manufacture of parts for the Monarch grubbing machine, scales, feed grinders, &c., made by the company. It is the intention of the company to make a regular line of farm scales out of all crucible steel, except the frame, which will be of rolled material. Starting with a purely local demand, the Monarch grubbing machines are now being shipped not only to every part of this country, but to foreign countries as well. The company is represented by branches in the leading cities of the United States and in Mexico, Porto Rico, Chile, Austria, Columbia and Argentina. The company is officered, and its business managed by Mr. Zimmerman and his five sons.

The N. C. Davison Company, representing the Riverside Engine Company, Oil City, Pa., has moved its offices from the Empire Building, Pittsburgh, to larger quarters in Rooms 1710-1711 Keenan Building.

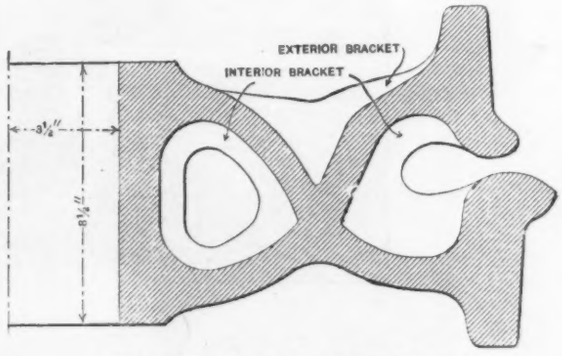
* In connection with this illustration it may be interesting to refer to Fig. 2 of the article, "The Sturtevant Steam Turbine," in *The Iron Age*, October 31, 1907, which shows a vertical Becker-Brainard milling machine cutting buckets in the side of a different type of turbine wheel.

A Double Tread Car Wheel.

A new type of chilled car wheel has been invented by P. H. Griffin, Buffalo, N. Y., in which a second or inner chilled tread is provided upon which brake applications are made, thus relieving the outer tread of the severe wear and damage due to excessive friction and heating from brake service. The new tread is slightly smaller than the present one and is connected with the body of the wheel in exactly the same manner as the outer tread. The line section and curvatures of the inner tread being the same as those of the outer tread no new conditions arise relative to efficiency or the result of brake applications. The inventor argues that by removing the friction of the brakes from the load bearing tread the life of the latter will be much increased, and relief will be obtained from the defects caused by the severe heating of the part of the wheel upon which safety depends. It is stated that the new wheels can be used for centers for steel tired wheels in passenger service with equally good results. While the standard section of 33-in. chilled wheel weighing 700 lb., as now used by the railroads, seems to have sufficient strength in the body, even for service under 50-ton cars, there has been an increasing number of failures of wheels in heavy service because of troubles with tread and flange. These arise largely from severe braking friction.

It is stated that foundry practice in the manufacture of the double tread wheel would not be much more difficult than with the present single tread wheel, the division between the treads being made with a pan core in the way employed for the division of the double plates for the ordinary type of wheel. In the case of a 700-lb. standard wheel it is estimated that the inner tread would add about 200 lb. to the weight of the wheel. While this means additional cost it also means increased scrap value. The accompanying illustration shows a flange on the inner tread to keep the brake shoe from touching the other flange, but the wheel may be made without the second flange.

The Griffin Double Tread Car Wheel Company, Buffalo, N. Y., has been incorporated with a capital of $200,000 to introduce the manufacture and use of the double tread wheel. The company will have its general



The Griffin Double Tread Car Wheel.

office in Buffalo, but does not contemplate the manufacture of the double tread wheel. For the present the company will confine its operations to making arrangements with railroads and chilled car wheel makers by which this wheel can be readily obtained. It requires from 15,000 to 20,000 new wheels a day to maintain repairs in the United States alone, and since by the advent of the 50-ton car, wheel failures have been increased greatly, the new company considers that it has a large field for operation. The officers of the company are the following: Henry F. Griffin, president; C. W. Cuthell, treasurer, and W. A. Griffin, secretary.

The Upson Nut Company, Cleveland, will greatly improve its River blast furnace property by the erection of a 900-ft. reinforced concrete dock along the river front. The contract has been awarded to the Great Lakes Dredge & Dock Company.

The Taylor & Fenn Screw Slotter.

The Taylor & Fenn Company, Hartford, Conn., has added to its line of machinery a new screw slotter, designed to slot screws automatically up to ⅜ in. diameter at the rate of from 16 to 28 per min., according to their size. Its builder has departed from the common practice of slotting toward the center of the turret. Instead, the cutter travels in a plane tangent to the turret circumference, so that slight inexactness of indexing cannot affect the central location of the slot. This method also gives a slot the bottom of which is concave.

The camshaft and the hopper mechanism, producing all feeding movements, are driven from a pulley that is not keyed to the shaft, but is held between two friction disks, one at each end of the hub, which are adjusted so

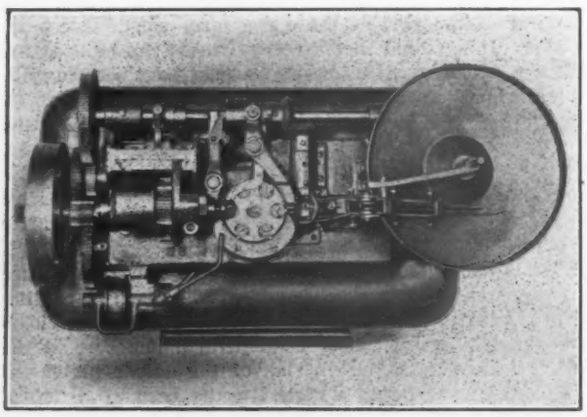


Fig. 1.—Top View.

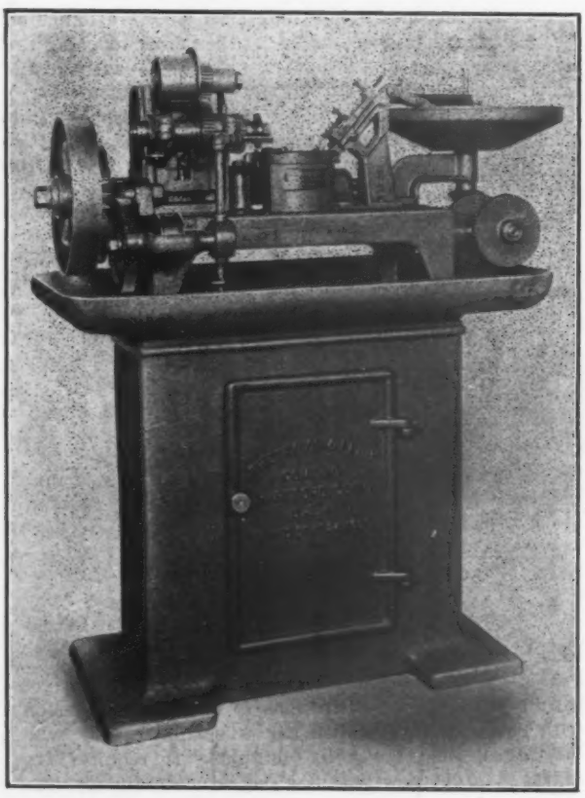


Fig. 2.—Front View.

The New Screw Slotter Built by the Taylor & Fenn Company, Hartford, Conn.

that the machine will perform its work except under abnormal conditions, such as the clogging of blanks, in which case the pulley would slip before the mechanism could be damaged. On the driving shaft is a wide faced pinion from which power is transmitted to the camshaft through a train of gears, and also to the hopper shaft. The cutter is driven by a separate belt.

The blanks are delivered from the magazine to the turret, one at a time, this being assured by the action of the escapement mechanism, operated through the lever *a* by a cam on the camshaft, as shown in the line drawing, Fig. 3. This lever has adjustment for different sizes of blank through the screw *b*. When the turret indexes the escapement opens, permitting the delivery of one blank only.

The turret has six cylindrical holders, one of which is seen at *c*. Each contains grooves for various sizes of blanks, and is fixed solid in the turret by a screw. To adjust the machine for a different size blank it is only necessary to loosen the screw of each holder and rotate it until the desired groove is in position. After the blank has been delivered from the escapement the same cam motion brings the stiff spring *d* against it, holding it in

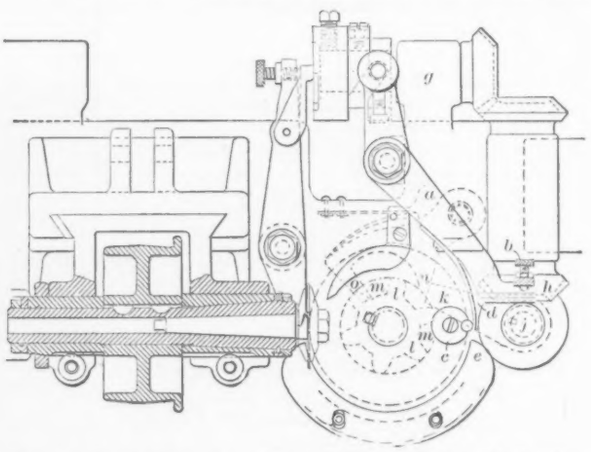


Fig. 3.—Detail Plan of the Turret and the Feeding Mechanism.

place in the groove until it enters the slot formed between the turret and the guide piece *e*. The guide piece is adjustable to give the widths of slot required for different sizes of screw.

At the instant that the blank leaves the slot, after being indexed to the cutting position, a clamping lever *f*, actuated by a cam on the camshaft, comes against it, holding it solidly against the body of the turret until the slotting operation is completed.

After the screw blank has been clamped in position for slotting the cutter slide cam comes into action, and the cutter arbor is moved downward. This cutter slide cam is so shaped that the cutter is moved down to the work very quickly and then takes up the proper feed for cutting to the predetermined depth, a slot the bottom of which is concave, conforming to the curvature of the cutter. When the cut is completed the cutter is instantly withdrawn, the slide being lifted by springs at the moment that the feed cam has rotated to release the pressure on the lever. Fine adjustments for depth of slot are obtained by a shoe operated by a screw, which raises or lowers the end of the slide lever. All the cam levers in the machine have this means of adjustment. The cutter may be located central with the blank by a fine longitudinal adjustment of the arbor. The different speeds required for the various sizes of work are derived through change gears.

The mechanism for indexing the turret contains a number of interesting features. The power is transmitted through a series of bevel gears from the camshaft, the central line of which is at *g*. The pinion *h* meshes a gear on shaft *j*, on which is the arm cam *k*. On the under side of the turret and integral with it are the gear shaped cam *l* and the index plate *m*. The notches in the index plate and the teeth in the gear-shaped cam correspond in number with the cylinder holders of the turret. The arm cam *k* has two functions. As it rotates, approaching the gear-shaped cam, it engages the shoulder *n* on the locking pawl *o*, which pivots on the stud *g*. This action withdraws the pawl from the notch of the index plate, and holds it until it rests inoperative against a neutral space of the plate. The drawing shows the mechanism in this position. The arm cam *k*, continuing to rotate then engages a tooth of the gear-shaped cam,

moving it through the index distance. This accomplished, the locking pawl enters the next notch under spring pressure.

The hopper is of the standard type for this class of work, differing only in that the guides are adjustable for different sizes of screws, and the guides and magazine are hinged to make the latter longer than is usual. All working parts are protected from fine chips, and from the entrance of loose blanks.

Class Freight Rates to Be Advanced.

BY R. L. ARDREY.

The railroads east of Chicago, in the territory of the Trunk Line Association and the Central Freight Association, have practically decided upon the advance that will be made in their class rates. Strenuous efforts will be made to have the new tariffs ready so that they can become effective July 1, although it may not be found possible to complete the task so soon. The basis of the new rates in this territory will be advances in class rates, between New York and Chicago, of 10 cents first class and 9, 7, 5, 3 and 2 cents on the lower classes.

The New Class Rates.

The new rates between New York and Chicago, both east and west bound, will compare with existing rates as follows:

	Cents per 100 lb.	
	Present rates.	New rates.
First class	75	85
Second class	65	74
Third class	50	57
Fourth class	35	40
Fifth class	30	33
Sixth class	25	27

All class rates in the territory east of Chicago and St. Louis and north of the Ohio River, both east and west bound, are based upon the New York-Chicago rates. The change in the base rates therefore changes all class rates. The map of this territory, from New England to the Mississippi, is divided into groups or districts, and each group of stations and towns takes a percentage of the New York-Chicago rate. The rate clerks who compile the new books of class rates have merely a routine task in calculating the percentages of the new basing rates.

Commodity Rates.

Pig Iron, billets, muck bar, scrap and about a dozen other crude forms of iron and steel are carried in this territory at commodity rates, so that they will not be affected by this change in class rates, but hardware and more than 200 articles of iron and steel which appear in the iron and steel list in the Official Classification will be affected by the increase. The articles in this list which are used by manufacturers as raw materials usually take the fourth-class rate in carloads, and fifth-class in less than carloads, but the lighter or more valuable forms of iron and steel are placed in the higher classes.

The story has been current among traffic men in the iron trade that the railroads would not include in this advance any important articles on which the rates have been advanced within the past year or two. It was understood that an exception would be made of such articles by putting them in a comprehensive commodity tariff which would maintain the rates now in effect. Well informed railroad men, however, say that this report is not well founded, as it would be impracticable for them to make any wholesale exception of iron and steel articles in the proposed advance.

Nature of the Advances from 1899 to 1907.

Less than a year ago, effective June 1, 1907, some 170 important articles of iron and steel were advanced half a class in the Official Classification. There was a similar advance of half a class in 1899, when the Official Classification raised these articles a full class, but afterward authorized a reduction which was maintained by the railroads in the form of an "exception tariff" until last year, when the roads withdrew or canceled the exception sheet and made these articles subject to the regular ratings of the classification; that is, subject to the original increase of a full class, which had been provided for in 1899. All of these articles, from 1899 to 1907, were carried at rates 10 per cent. above sixth class, carloads, but were raised to fifth class. In less than carloads they had been carried at 10 per cent. above fifth class, but were raised to fourth class.

In addition to this advance of a full class in the rates, in 1899 and 1907, there was also a general increase in the minimum weights of iron and steel articles required in a carload, effective in the Official Classification of August 1, 1907. Articles which had been subject to the minimum of 24,000 lb. were generally raised to 30,000, and those which had been rated at 30,000 were increased to 36,000. On many products like agricultural implements the minimum was arranged on a sliding scale, the specified minimum being for a car not longer than 36 ft. 6 in., but running up to 60,000 lb. for the largest cars. This change in minimum weights did not affect the rate, and proved no hardship to those who buy in large quantities, but many dealers, jobbers and small industries found it embarrassing.

No General Revision of Class Rates for 20 Years.

The class rates which it is now proposed to increase have not been changed for 20 years, since the original Interstate Commerce law forced a general re-alignment of class rates to conform with the long and short haul clause. Railroad men connected with the movement insist that an advance is absolutely necessary to cover the increase in operating expenses in recent years, and to enable them to make provision for the future growth of traffic. Wages have advanced for all classes of labor employed in building and operating the roads, and it has been found impossible to make any general readjustment in the period of depression which the country has passed through. Coal and all the supplies used cost more than in former years, taxes have been growing by leaps and bounds, and terminal expenses absorb more and more of the revenue. There is a general need among railroads for better terminal facilities, but real estate values in all the cities where more tracks are needed have arisen to figurs out of all proportion to the improvements that have been made on the property. It has also become a necessity, involving the outlay of enormous sums, to elevate railroad tracks wherever they pass through a city of any size.

Along with this increase in operating expenses and cost of construction has come a corresponding increase in the cost of money. A few years ago many bond issues were floated by railroads at 3½ per cent., but now the best roads, to obtain capital, must commit their credit for a long period of years, at rates running all the way from 4 to 5 per cent. Roads which represent a large share of the total mileage of the country have actually exhausted their credit, on the basis of their present earnings. For several years practically all the important systems have resorted to the expedient of borrowing on two and three year notes, hoping that before maturity they would be able to refund with low rate bonds, but they have been disappointed in this respect, and have accepted the necessity of paying higher rates on their funded debts.

The Situation as to Commodity Rates.

As stated recently in *The Iron Age* the traffic managers of the railroads have not been in sympathy with this advance, and generally disapprove of any increase in a time of business depression. Few of them have been consulted, or even informed of the advance, which has been made under orders from the financial management. It is understood that this revision of class rates will be followed by a general overhauling of the commodity tariffs, which cover the heavy materials used by industries, but the work of revision has not proceeded far enough to disclose the extent of the advance.

While class rates, as stated, have not been changed in 20 years, there has been a general advance in the past 10 years in the charges on commodities. The greater part of this general advance was accomplished by the withdrawal of discounts and readjustments, which were generally allowed to industries prior to the passage of the Elkins law; but there has also been an almost con-

tinuous advance in the printed rates, which in some cases are 100 per cent. higher than the charges actually paid 10 to 20 years ago. Many consumers are paying 50 per cent. higher charges on pig iron, and rates on other important commodities have been raised, altogether, 25 to 50 per cent. above the basis that prevailed 10 to 15 years ago.

Railroads Will Be Purchasers of Supplies.

It is understood that the announcement of the new rates will be followed or accompanied by a renewal of activity in the purchasing departments of the roads. In the past six months purchases have been limited to imperative necessities. Car and locomotive repairing and track work have been practically suspended, until the roads have an accumulation of more than 200,000 "bad order" cars awaiting shop repairs, besides an equally large or larger number awaiting repairs which can be made on track.

There are prospects for large crops this fall, and this accumulation of repair work must be taken care of, as well as track work for the heavy traffic of the fall and winter months. Many careful observers believe that the general business of the country will return to practically a normal basis whenever the railroads resume buying, repair and construction work. It will undoubtedly modify the opposition of business men to the proposed advance in rates, if it is accompanied or immediately followed by a revival of trade.

The Richmond Foundry & Mfg. Company.

The Richmond Foundry & Mfg. Company, Richmond, Va., was organized in April, 1902. Its business soon grew to such proportions that it was necessary to secure larger quarters. A tract of 10 acres was purchased on the northern side of the city, adjacent to the Seaboard Air Line Railway and the Richmond, Fredericksburg & Potomac Railroad. On this land an extensive plant has been erected. The work of construction commenced in the spring of 1906, and the plant was completed and equipped early in 1907.

The buildings comprise a foundry, blower house, pattern vault, mill room, grinding room, casting storage house, machine shops, warehouse, shipping room, &c. These building are so arranged that the progress of work through the plant is continuous and in one direction; the raw material entering at one end of the plant and the finished product leaving at the other. Private spur tracks run from the railroad to the material yard and to the shipping department.

The foundry, which is 80 x 320 ft., is constructed of steel with a brick curtain wall. The main windows rise to the eaves line and form a continuous line of glass on all sides of the building. These windows, with the monitor lights, flood the building with an abundance of daylight. The charging platform and the roof over the platform and adjacent to the cupolas are constructed of reinforced concrete. In the case of the platform this concrete is supported by heavy I-beams. An industrial track runs from the material yard to an elevator and on the platform. The iron and coke are carried on cars directly to the cupolas. The cupolas are blown by means of a Root blower driven by a variable speed Westinghouse motor. The foundry will accommodate 80 molders, who are engaged principally on bench work and light floor work. A double overhead trolley track runs down the center of the building, and a single track continues on through the plant to the shipping department.

In connection with the foundry there is a roomy fireproof pattern vault, having heavy brick walls and a reinforced concrete roof, and provided with a heavy double door of steel running in vertical guides. The mill room is 80 ft. square, with a capacity of 35 molds, leaving abundant space for handling castings and cleaning such work as cannot be cleaned in the molds. The grinding and inspecting department and the pattern storage room are, each 40 x 80 ft. The former is fitted with heavy and light grinders and sorting tables, and the latter with bins and racks for castings.

The machine shops are 80 x 160 ft. The warehouse is a three-story building, having about 29,000 sq. ft. of floor space. This building is of very heavy construction; the upper floors being so designed that they can at any time be used for extra machine shop space.

Standing within the angle formed by the foundry and other buildings is a brick building, 50 x 65 ft., surmounted by a brick tower upon which is placed a water tank. In this building are the pump room and the lavatories for the company's employees. Each man is provided with a Merritt steel locker. A plentiful supply of shower baths, porcelain washbasins, closets and other toilet necessaries, besides both hot and cold water is furnished. The labor employed by the company is of a high class, and the provision made in every direction for the comfort and cleanliness of the men is greatly appreciated.

The principal work of the company is the making of fine gray iron castings for manufacturers, light and medium machinery castings and stove plate. It also makes a specialty of computing and other scales. The company also conducts a line of special machine work to order. The officers of the company are as follows: Arthur Scrivenor, president and general manager; R. G. Rennolds, vice-president, and J. Stuart Reynolds, secretary and treasurer.

The Iron and Steel Institute.

The annual meeting of the Iron and Stel Institute will be held at the Institution of Civil Engineers, Westminster, London, May 14 and 15. Among papers to be read are the following:

"Cast Iron in the Construction of Chemical Plant," by F. J. R. Carulla.

"An Experimental Electric Furnace for the Smelting of Iron," by Prof. B. Igewsky.

"The Pyrometric Installation of the Ordnance Factories at Woolwich," by J. Wesley Lambert.

"Improvements in Plate Rolling Mills," by A. Lamberton.

"The Application of Color Photography to Metallography," by E. F. Law.

"The Department of Metallurgical Chemistry in the National Physical Laboratory," by W. Rosenhain.

"The Utilization of Blast Furnace Slag for Portland Cement," by C. von Schwarz.

"A New Fatigue Test for Iron and Steel," by T. E. Stanton.

"The Physical Qualities of Steel in Relation to Its Mechanical Treatment," by James E. York, New York.

The Canadian Mining Institute is arranging for an excursion in September this year to the mineral areas of eastern Canada, including the silver cobalt ore region, the nickel mines and the iron ore mines of Ontario, the asbestos and chromite region of the Province of Quebec and possibly the coal and iron districts of Nova Scotia. The members of the Iron and Steel Institute have been invited to take part in this excursion.

The Acheson Graphite Works.—The International Acheson Graphite Company, Niagara Falls, N. Y., is about to make extensive additions to its works. The total cost will be about $100,000. The improvement will consist of a new furnace room, a new grinding and storage building and a new switchboard house. The furnace room will be a one-story building, 100 x 120 ft., the frame to be of steel and the walls of brick. It will afford room for 12 furnaces, which will about double the capacity of the plant. The new grinding and storage building will be 50 x 100 ft., three stories. The frame will be of steel and the walls of brick. This structure will absorb the present grinding room. A portion of this building will be used for storing graphite and stock goods generally, particularly electrodes. The switchboard house will be 20 x 36 ft. This building will contain all receiving and distributing panels, and the present switchboards will be transferred to it on completion. Last year the company erected a fine steel and brick building 55 x 112 ft., and this is now well occupied. On the first floor electrodes are received and shipped, while the second floor is applied to grinding and storing graphite for lubricating purposes. The third and fourth floors are used as a factory for Oildag, the name given by Mr. Acheson to his new lubricant, consisting of deflocculated graphite that remains suspended in oil.

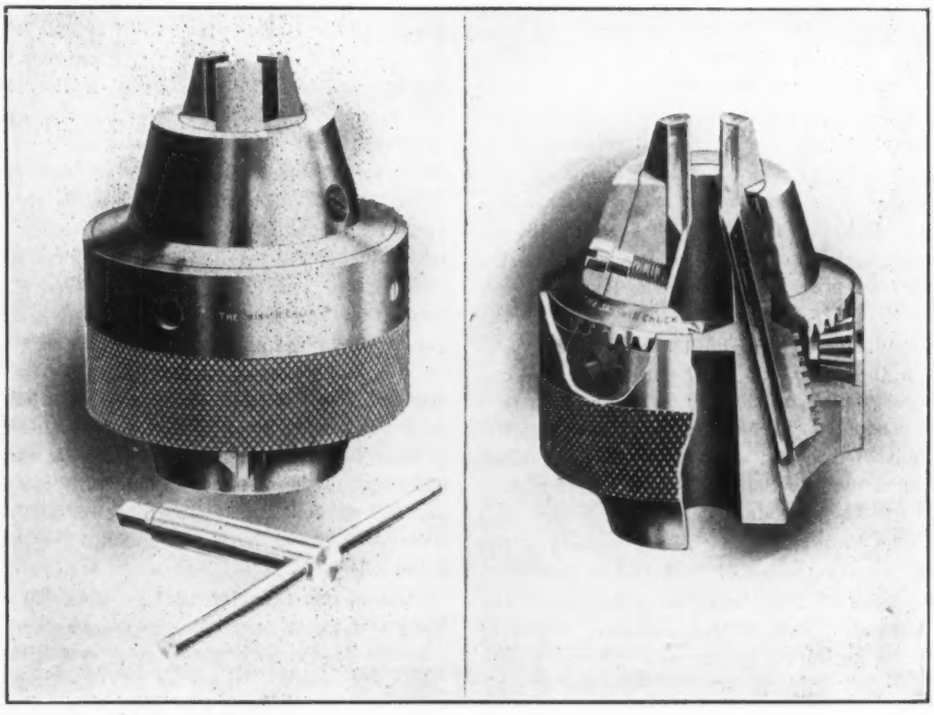
The Skinner New Geared Pattern Drill Chuck.

The illustrations herewith show an improved form of the Skinner New Model drill chuck, made by the Skinner Chuck Company, New Britain, Conn., and designated as the "geared pattern." The new model chuck was operated by hand, and when a very strong grip was desired it was obtained by the use of a spanner wrench. This means of tightening the chuck is sometimes objectionable on a light drill where the spindle has a tendency to turn when the spanner wrench is used. In the geared pattern chuck, by rack and pinion gears, it is possible to operate the chuck by hand as before, and with a common form of key wrench the chuck may be tightened sufficiently to drive a high speed twist drill to its limit, and in tightening the chuck in this manner there is no strain, tending to revolve the spindle of the lightest machine. As this chuck is tightened the pinion travels on the rack gear, giving a very powerful grip, but the wrench is used only to make the final grip and for loosening the chuck; all adjustments for different sizes of tools are more quickly made by revolving the chuck by hand.

Attention is called to the long bearing of the jaw in the solid threaded nut, and to the form of the jaw where it travels on the inclined bottoms of slots milled in the chuck body. The jaws are supported in these milled slots and have no tendency to turn or rotate under the strain of holding the tool. The first geared pattern chucks were made up with only one pinion, but shortly the construction was changed and two pinions are now furnished in each chuck. This insures longer life of the gearing, gives two places instead of one to apply the wrench, and in case a pinion should break the chuck would still be serviceable with one pinion.

From its past experience in the manufacture of chucks the company decided to continue to make the jaws of the chuck from the same brand and make of steel that has been used for years. To further insure uniformity each chuck is hardened at exactly a uniform heat in an electric furnace, and the chucks are tested before leaving the works. Errors and inaccuracies amounting to 0.002 in. or over are sufficient to cause the chuck to be rejected, which results in a uniform quality and accuracy of the output. All gears are hardened, and the jaws and cap are hardened and ground.

This chuck can be furnished with a hole through the center the full capacity of the chuck for use on a hollow spindle machine. It is readily taken apart to clean and oil, the only tool necessary being a screwdriver. The appearance of the chuck is neat; there are no projections to injure either the work or the workman. Two sizes are now ready for delivery, and other sizes will be furnished later.



The Geared Pattern New Model Drill Chuck Made by the Skinner Chuck Company, New Britain, Conn.

The Strength of Chain Links.

Bulletin No. 18, on the above subject, by G. A. Goodenough and L. E. Moore, has just been issued by the Engineering Experiment Station of the University of Illinois. A series of experiments on chain links and circular rings, covering a period of two years, has been made for the purpose of confirming or disproving a theoretical analysis of the stresses in links and rings. A comparison of calculated and measured distortions affords the desired test. The result of the experiments is a complete confirmation of the analysis. Having a reliable theory, the bending moments and maximum stresses are calculated for links of various forms, and the results of such calculations are applied to the formulas for the loading of chains given by Unwin, Bach and Weisbach. It is shown that the usual formulas for chain loads give maximum tensile stresses of 33,000 to 40,000 lb. per square inch, and maximum compressive stresses of 60,000 lb. per square inch. New formulas for safe loads are proposed. The bulletin is concluded with four appendices giving in full the theoretical discussion, which is the basis of the experimental work.

This bulletin will be of special interest to all engineers and manufacturers who are concerned in any way with hoisting and transmission. Copies may be obtained upon application to the director, L. P. Breckenridge, Engineering Experiment Station, Urbana, Ill.

Announcement is made of the eleventh annual meeting of the American Society for Testing Materials, which will be held at the Hotel Traymore, Atlantic City, N. J., Tuesday to Saturday, inclusive, June 23-27. By lengthening the time from three days, as heretofore, to five days the necessity of holding sessions of different sections concurrently will be avoided, and provision can be made for periods of recreation and special social features. The membership of the society has increased since the last annual meeting from 925 to 1005.

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RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR.

Large and Small Interests in the Iron Trade.

A new edition of the Directory of the Iron and Steel Works of the United States, such as has just come from the press, gives one a fresh sense of the commanding character of American iron and steel industries, measured alongside those shown in the lists of other countries. The great aggregations of capital represented in our iron and steel works and their foundations of mineral wealth become more imposing when catalogued in a single volume. But the Directory does not give evidence that centralization of control of the iron industry has gone on in any marked way since the last Directory was issued, in 1904. It is true that the opportunity to embark upon iron and steel manufacture has been narrowing through the taking up of the desirable and accessible iron ore supplies of the country. It is also true that the large consolidations have made most of the important additions to iron and steel works capacity since 1904. But it is noticeable that the smaller independent interests have not been eliminated in recent years, and a number of them have extended their operations in the period between the Directories of 1904 and of late 1907.

In the last issue of *The Iron Age* a summary was given of the various classes of iron and steel works in the United States as shown by the new volume, and a comparison was made with the Directory figures of 1904. The total number of rolling mills and steel works in 1904 was 572; in November, 1907, it was 598, an increase of 26. At first sight this increase might suggest that the number of smaller interests is greater to-day than four years ago. An analysis of the figures shows that the number of rolling mills has actually decreased, and that the increase is under the "steel works" head, being entirely due, moreover, to the building of small steel casting plants, since there has been no increase in the number of steel works with which rolling mills are connected. This will appear from the following table:

Steel Works in the United States in November, 1907, and June, 1904.

	Steel works (including foundries).		Steel foundries.	
	1907.	1904.	1907.	1904.
Open hearth	159	135	101	84
Standard Bessemer	30	32 }	43	20
Special Bessemer	40	19 }		
Crucible and miscellaneous	79	57	55	30
Totals	308	243	199	134

The table shows that the number of steel foundries increased by 65 in the interval of nearly three and a half years between the two Directories. This is also the exact difference between the first two columns in the above table, indicating that the building of new steel plants for the production of rolled material must have been exactly balanced by the dismantling of plants of this character.

Referring again to the totals of "rolling mills and steel works" in 1907 and 1904—namely, 598 and 572—it appears that if the number of steel works increased by 65 there must have been a net loss of 39 in the number of rolling mills. A reference to the list of abandoned works shows that the mortality has indeed been great. This has not been due as much as might be supposed to the disappearance of the small manufacturer. Many of the abandoned plants belonged to large companies. For example, the Republic Iron & Steel Company abandoned 15 rolling mills, the American Sheet & Tin Plate Company abandoned five plants, and the American Steel & Wire Company, Carnegie Steel Company and Crucible Steel Company of America, two each. In these cases the process was simply one of readjustment through the elimination of works whose operation was uneconomical, or that would require an unwarranted outlay for rehabilitation and modernizing.

It is known that the important additions made to the plants of the large producers in recent years have made the output of the smaller manufacturers who buy their steel in the market a relatively smaller factor than formerly. It would be interesting to know, however, whether these smaller interests have even maintained their actual output in the face of high prices for semi-finished steel and moderate prices for the finished product. In the sheet and tin plate trades the hardships under which the smaller manufacturers have worked in the past few years have frequently been a matter of comment. In the wire trade independent manufacturers began several years ago to provide their own steel supply by building open hearth works. This was done to some extent in the sheet and tin plate trades, but there is still such a dependence upon large steel producers for supplies of sheet bars as to constitute a problem under the present alignment of prices. In the bar trade the price of billets and the efficient continuous mills of the large producers have made steel bars rolled from purchased billets a negligible factor.

While the capacity ratings given in the Directory have a value in permitting of comparison with those in previous issues they differ quite widely in many cases from the actual output of the plants mentioned. It would be interesting to know from year to year what proportion of the output of finished iron and steel in the United States is furnished by the large interests which have their own fuel and ores. Last year the United States Steel Corporation marketed 758,699 tons of blooms, billets, slabs and sheet and tin plate bars. Deducting this amount from its total of rolled products leaves 9,618,043 tons of finished iron and steel which it put on the market. Only one of the large independent companies gives similar statistics, but it is well known that all sell a certain tonnage of semifinished steel, which is worked up in the mills of small producers. While no basis exists for an exact calculation it would be fair to say that the steel products marketed in finished form by the Lackawanna, Cambria, Jones & Laughlin, Pennsylvania and Maryland, Republic, Colorado and Bethlehem companies last year were something more than half the total for the United States Steel Corporation.

In 1906 the total output of rolled iron and steel in the United States was 19,588,468 gross tons. Last year's total was not far from this amount. It would appear, therefore, if we allow 14,500,000 to 15,000,000 tons for the finished output of the Steel Corporation and the other large companies, that the total produced by the various

steel companies not named above, and by smaller rolling mills buying their scrap or their steel billets in the open market was nearly 5,000,000 tons, or about 25 per cent.

Most significant of all the comparisons made between the Directories of 1904 and 1907 is that which refers to open hearth steel capacity, the increase being from 11,335,100 tons in June, 1904, to 18,824,900 tons in November, 1907, or nearly 70 per cent. The Bessemer capacity, by contrast, increased only about 10 per cent., or from 13,628,600 tons to 15,020,200 tons. Noteworthy figures apart from the above are those which show declines. For example, the annual capacity of charcoal blast furnaces decreased from 851,600 tons to 757,800 tons, and that of furnaces using anthracite or anthracite and coke, from 3,019,900 tons to 2,315,400 tons. The number of puddling furnaces declined from 3161 to 2635, and of heating furnaces from 3995 to 3971.

Perhaps the strongest impression carried away from a close examination of the new Directory is that with all the remarkable expansion of the leading iron and steel interests of the country there is still a very vigorous and enterprising collection of smaller units whose hold upon the trade must not be underestimated.

Steel Prices and the Ore Supply.

A lack of information seems to exist relative to conditions in the steel trade following the panic of 1893. Quite a number of writers who treat the present condition of business as one which involves the application of pure economic laws are endeavoring to draw parallels between the situation in the steel trade at that time and conditions which are found at present. It is inferred that as prices on all kinds of steel products were exceedingly low in the depressed period following the panic of 1893 a similar course of prices should be witnessed at this time. The assumption is made that prices in that former period were reduced perforce by steel manufacturers for the purpose of stimulating business. The following quotation from a financial article in the New York *Evening Post* of April 25 is a sample of the general line of reasoning:

> Improved access to foreign markets, and solidarity of industry through consolidation, have undoubtedly created a very different situation from that of 1893. The test of their actual value lies immediately before us. The great revival of home and foreign trade, in 1897 and 1898, came not only through great economies in production, but through fixing of prices low enough to undersell the outside world and enlarge consumption. That process was begun in the steel trade, which is just now persisting in an exactly opposite policy.

The writer of the above extract, who is here taken as the representative of a class of writers on trade conditions, is evidently not aware that the steel trade in the depression of the '90's was operating on a revolutionary basis of values. The manufacturers of steel were then enabled to appreciate fully the opening up of the vast deposits of iron ore on the Mesaba Range in northern Minnesota. These deposits, comprising high grade steelmaking ores, were being worked by steam shovels, the operations being conducted by quite a number of strongly competitive companies, all striving to secure the largest share of a limited demand. The ore was delivered to Lower Lake ports at such low prices that steel making irons were produced from these ores at lower cost than had ever been known. In consequence of the cheapness of the raw material, prices of steel products sagged all along the line. It was this fact which enabled the steel makers of this country to undersell their competitors in all parts of the world, even in localities where steel had previously been produced cheapest. It was this fact, therefore, which caused our exports of all highly finished iron and steel products to increase to such an unprecedented extent at that time.

It will be seen that conditions at that time were very different from those now prevailing. Since then our consumption of iron ore has increased enormously, owing to the very great expansion of our iron and steel industries, and we are exhausting our ore supplies at a rate far in excess of anything deemed likely ten years ago. No new discoveries of iron ore of importance have recently been made in this country, and certainly nothing approaching the great discovery of the Mesaba deposits in the early '90's. We have therefore nothing of this sort to warrant a correspondingly heavy reduction in the price of steel products.

The Combustion Engine and Shop Heating.

The heating of a shop driven by gas engines or electric motors requires an auxiliary heating system. Instead of depending upon exhaust steam, or steam directly from the power boiler when the engine is shut down, boilers must be provided for heating alone, of adequate capacity to comfortably warm all rooms and in some cases furnish heat for manufacturing processes. It is the same condition that existed where mills were operated by water power before auxiliary steam power plants were considered necessary as reserves. In the meantime the science of steam heating has advanced and far more economical systems have been evolved.

Some believe that the exhaust gases of combustion engines will be utilized for heating purposes. One practical engineer proposes passing the exhaust from the engine through coils in a water chamber, and thus generate the steam for heating. An objection to this is that the coils would be likely to clog, especially when there is, as frequently, imperfect combustion in the engine. But greater difficulties than this have been overcome. It is fair to presume that with further development of the newer types of engine, more perfect and even combustion will be secured. For the present, however, the steam and occasionally the hot water system will be employed generally.

Heating engineers are working out improved applications of old principles to secure better results in industrial buildings of all descriptions, with special attention to economy as well as efficiency. The problem presents itself frequently in connection with ventilating systems. Mill engineers are deeply interested in the subject, but it is not given sufficient attention in some cases, where, as is quite common, the plans for new construction are made in the manufacturer's drafting room. Neglect of this sort is likely to prove costly, in inadequacy or wastefulness or both, and is most common in small shops and factories using a combustion engine or electric motors operated on purchased power. In figuring the economy of such a solution of the power question, it should be remembered that the works must be heated nearly if not quite six months of the year in most parts of the country, and unless an economical heating system can be installed, it is probable that the cheaper power may be in the end the more expensive.

The problems presented differ in individual plants, and it seldom happens that special study of the question of heating does not prove profitable. The apparatus available offers a wide selection, and the best for the purpose can generally be found. For example, the vacuum systems often possess advantages worth investigating, for

they have been used to excellent advantage in many manufacturing plants.

The builders of combustion engines have not worked out this phase of the selling end of their business to the degree that its importance deserves. It is a strong argument of the steam engine salesman, that the heating plant must be taken as a part of the engine equipment. To meet this the combustion engine advocates should study the problem of auxiliary heating in all its aspects, that they may supply prospective customers with expert assistance. Co-operation between them and the builders of low pressure heating systems and appliances might result in mutual advantage.

CORRESPONDENCE.

An English Revival of the Mitis Process.

To the Editor: I have read with interest the paper entitled "Malleable Castings by a New Process" in your issue of April 23, page 1312. [A paper before the West of Scotland Iron and Steel Institute by E. C. Ongley.] This looks like a revival of the old "Mitis Process of Producing Wrought Iron Castings," which made quite a stir in the world over 20 years ago. I have before me an elaborate and beautifully illustrated brochure having the foregoing title, compiled by W. F. Durfee, M. E., general manager U. S. Mitis Company, 26 Broadway, New York, 1886, describing the process in detail and showing photographs of perhaps 100 articles, such as horseshoes, wrenches, pulleys, chains, gears and other machine parts, together with many ornamental castings of great beauty and delicacy—viz., medals, coats-of-arms in relief, plaques, and even an Achilles shield, evidently a faithful copy from the famous original. I remember the exhibit and was particularly impressed with a casting resembling a coarse brush, the "bristles" and back all cast in one piece, and each bristle could be bent back and forth with the finger readily! The title page of the pamphlet contains the following imposing list of officers of the U. S. Mitis Company: President, Robt. H. Sayre, Bethlehem, Pa.; vice-president, Peter Ostberg, Stockholm, Sweden (inventor); treasurer, Frederic A. Potts, New York; secretary, Pedro G. Salom, Philadelphia, Pa. The directors were (in addition to the officers already named): John Fritz, Bethlehem, Pa.; John T. Morris, Philadelphia, Pa., and Henry Howard, Providence, R. I.

You are doubtless familiar with the history of this company and its long litigation in which it was eventually successful in obtaining large royalties from various steel manufacturing companies, now controlled by the United States Steel Corporation for the use of a small quantity of aluminum in their steel bath, this being the basis of the Mitis patents, which have since then expired. One of the features of the Mitis castings similar to the claims made in the article in *The Iron Age* of April 23 was that they did not require any annealing.

ALEX. E. OUTERBRIDGE, JR.

PHILADELPHIA, PA., April 25, 1908.

The Cassier Magazine Company announces the removal of its New York offices from 3 West Twenty-ninth street to 12 West Thirty-first street. The new home of *Cassier's Magazine* is in the office building just erected on the site of the former house of the American Society of Mechanical Engineers, a location especially convenient of access from the new railroad terminals and easily reached by the various systems of local transport from all parts of the city.

Mackintosh, Hemphill & Co., Pittsburgh, are furnishing a 46-in., three-high blooming mill and a 28-in., three-high finishing mill, to be installed in the new open hearth steel plant of the Pittsburgh Steel Company, Monessen, Pa. Shipments on both contracts are being made as fast as possible. It is the intention of the Pittsburgh Steel Company to put its new steel plant in operation not later than July 1.

PERSONAL.

F. K. Rhines, who since January 1 has been assistant to W. H. Foster, treasurer and general manager of the General Fireproofing Company, Youngstown, Ohio, has taken up the work in the sales department of H. B. McMaster, who recently resigned to accept a position in the wire department of the Youngstown Sheet & Tube Company.

C. J. Morgan, vice-president of the Taylor & Boggis Foundry Company, Cleveland, returned home last week from a three months' trip to the Mediterranean.

Taylor Alderdice, third vice-president of the National Tube Company; Samuel A. Benner, manager of sales of the Carnegie Steel Company, and J. B. Laughlin of the Jones & Laughlin Steel Company, have been elected directors of the South Side Trust Company, Pittsburgh.

Benjamin Talbot of Middlesbrough, the well-known inventor of the continuous open hearth process, will be the recipient of the Bessemer gold medal at the Iron and Steel Institute meeting on May 14.

Among those proposed for membership in the Iron and Steel Institute of London are Robert L. Ahles of Williamsport, Pa.; R. F. Boehler of Columbia University, New York; Norman F. Harriman of the Union Pacific Laboratory, Omaha, Neb., and Knox Taylor of the Taylor Iron & Steel Company, High Bridge, N. J.

Frederic F. Hartigan, superintendent of the work on one of the sections of the Culebra division of the Panama Canal, with headquarters at Baso Bisbo, is at the Holland House, New York. He will spend a six weeks' vacation in this country.

E. H. Darrach, secretary and treasurer of the Interstate Car Company, Brightwood, Ind., has returned from a trip to Cuba, where he has been investigating conditions and arranging for the marketing of his company's product.

Charles A. Maher, who is now and has been since its formation vice-president of the National Car Wheel Company, has associated himself with Otis, Bonnell & Co. as sales manager of the car wheel department, with offices at 408, 409, 410 Cuyahoga Building, Cleveland, Ohio. J. E. Rawson will continue as sales manager of the steel department. Wm. F. Bonnell will devote his time largely to the interests of the Securities Corporation, Ltd., 40 Wall street, New York, and the Guanajuato Development Company, Guanajuato, Mexico.

Theodore F. Dredge, formerly representing the Crane Company in San Francisco and London, has taken the management of the engineering and heating supply department of the Geo. H. Tay Company, San Francisco.

The Board of Directors of the United States Steel Corporation on Tuesday re-elected the former list of officers as follows: Elbert H. Gary, chairman; William E. Corey, president; James Gayley, first vice-president; William B. Dickson, second vice-president; Francis J. Filbert, comptroller. President Corey sails for Europe on Thursday for a two months' vacation.

An interesting lesson in economy is contained in a recent publication issued by the Electric Controller & Supply Company, Cleveland, Ohio, concerning the uses of its line of powerful lifting magnets. The publication relates that a steel foundry, where one of the magnets was in use, recently received a car for loading purposes which had been used for shipping pig iron. A magnet used in the company's yard was lowered to within 3 in. of the car floor and swept over its surface. It picked up over 600 lb. of pig iron chips and dust which were loaded into a charging box. With pig iron at $20 a ton, which was then the prevailing price, the company figured that it had been presented by some one with $6 worth of iron.

The Meehan Boiler & Construction Company, Youngstown, Ohio, has received the contract for all the iron work for repairs to the Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio.

New Steel Rail Specifications.

The Report of the American Railway Association's Committee.

At the semiannual meeting of the American Railway Association held in New York April 22 the Committee on Standard Rail and Wheel Sections submitted its report, which represents the results of months of investigation of the steel rail problem. At the October meeting of the association the same committee made a report of progress and presented new rail sections, which were illustrated and described in *The Iron Age* of November 28, 1907, page 1540. They were designated as "Type A" and "Type B" Series, each having five different weights—namely, for 60-lb., 70-lb., 80-lb., 90-lb. and 100-lb. rails. Both differ from the A. S. C. E. sections in putting more metal in the flange, Type A being a modification of the Dudley, or stiff girder, section, while Type B has a slightly better distribution of metal than Type A, and the width of the head is a trifle less. After the October meeting the committee, as requested by the association, continued its investigations, holding meetings as follows: In New York, October 29, 1907; in Pittsburgh, November 21; in Baltimore, December 19; in New York, January 10, 1908, and in Chicago, March 2 and 3, 1908. The members of the committee are the following:

G. L. Peck (chairman), general manager, Pennsylvania Lines West of Pittsburgh.

J. T. Richards, chief engineer of maintenance of way, Pennsylvania Railroad.

F. A. Delano, president, Wabash Railroad.

R. Montfort, consulting engineer, Louisville & Nashville Railroad.

Wm. Garstang, superintendent motive power, Cleveland, Cincinnati, Chicago & St. Louis Railway.

R. L. Ettenger, consulting mechanical engineer, Southern Railway.

W. E. Fowler, master car builder, Canadian Pacific Railway.

P. H. Dudley, inspecting engineer, New York Central Lines.

J. W. Kendrick, second vice-president, Atchison, Topeka & Santa Fé Railway.

We give the report almost entire below:

In compliance with the request contained in the resolution adopted at the October meeting of the association, the committee has continued its investigation of the question of proper specifications for the manufacture of steel rails, and has called to its assistance a number of disinterested experts. The committee has also conducted a series of tests at the different rail mills in connection with its investigation of the discard and other problems.

The Amount of Discard.

With regard to the discard question, the committee has always been of the opinion that it would be preferable to test the finished product rather than specify as to details of mill manufacture, and the chairman, in his circular letter of May 27, 1907, addressed to the executive officers of the steel companies, stated that "the natural way for the railroads to overcome these difficulties would be to insist upon such tests—physical, chemical and microscopical—as would result in giving them the kind of material they require for their purposes, and such as are universally required in the case of material for bridges, axles, &c."

The difficulties which have stood in the way of applying this theory in connection with the manufacture of steel rails have been caused by the fact that rails are generally ordered in very large quantities and the product of a rail mill is turned out at a very rapid rate. A system of detailed tests which would answer in the case of axles and other material where the product is not so rapidly turned out would not be practicable in the case of rails, because of the lack of time to complete the tests without curtailing the output of the plant. It was this difficulty which led to the adoption of specifications covering the details of mill practice, especially in connection with the discard.

In pursuing its investigation of this discard question, the committee received a suggestion from William Metcalf, to the effect that it would be reasonably practicable to apply the above theory to the manufacture of rails by arranging to test to destruction a number of rail butts representing a certain proportion of the total output, and to base rejections on the results of these tests. In order to determine the practicability of this suggestion, the committee arranged for a trial lot of rails to be rolled from the ingot without any discard whatever, except such as was necessary to enable the bloom to enter the rolls, and after these rails had been cut into small pieces, they were broken under the hammer and the fracture examined. This test proved to the satisfaction of the committee that if "pipes" or other physical defects were present they could be detected by this means. The test also proved quite conclusively that it is possible to so conduct the process of manufacture that the "pipes" or other physical defects will be reduced to a minimum, and that these defects may not occur at all, even in rails rolled from the top portion of the ingot.

In order to avoid an unnecessary waste of good material, the committee set about to devise means by which the rejection of defective material could be insured without requiring an arbitrary and definite percentage of discard in every case, and a committee of the Pennsylvania Railroad pursuing the same line of investigation adopted a tentative specification which provided for a physical test of this nature, and which further provided that when physical defects were discovered, all top rails of the heat should be rejected. This would result in a discard of about 25 or 30 per cent. of the entire metal in the heat whenever physical defects were discovered, and it was felt that a requirement of this nature would not only provide for the rejection of defective material, but would insure the greatest care on the part of the manufacturer. A trial lot of rails, of a section corresponding to Type B, submitted with the committee's report of last October, was recently rolled under this specification as to discard, and the results convinced the committee that a development of this idea would prove the best solution of the discard problem.

Rejection of Segregated Metal.

Some of the advocates of a fixed and arbitrary discard have argued that the mere provision of a discard to insure the elimination of "piped" rails, or rails containing physical defects, was not sufficient, and urged the rejection of a fixed percentage from the top of the ingot, because of the well known fact that segregation occurs in the upper portion. This question of segregation was given careful consideration by the committee, and while it is a fact that, due to the rearrangement of the constituent parts of the metal during the process of cooling and solidifying in the ingot mold, an analysis of the metal in the finished rail will often show a wide departure from the analysis required by the specifications, it is also true that an analysis of the metal taken from the different parts of the finished rail will frequently show similar wide variation. This discrepancy is due to the fact that the test ingot referred to in the specifications, and upon which the chemistry specification is based, is taken from the ladle before the metal is poured into the ingot mold, and consequently before the segregation takes place.

It has been assumed that, because of this variation from the standard composition of the metal in the finished rail, the rejection of all segregated metal would be warranted. But, on this assumption, it would be necessary to discard more than a third of the upper part of the ingot to be on the safe side, as the segregation frequently extends that far, and while our knowledge of the subject is not as complete as we could wish it to be, we have a great deal of evidence that rails of good physical condition can be made from the upper portion of the ingot. Furthermore, the analyses of a large number of rails taken after years of service indicate that these wide variations in chemical composition may occur without apparently affecting the safety or wearing quality of the rail, and since it is impossible to check the analysis of the finished rail with that of the test ingot, the question arises as to what limits should be placed on the variation which will be permissible. None of the experts consulted are ready to say what this limit should be, and all admit that no facts are available as the result of actual experience which would warrant the adoption of any fixed limit to govern the rejection of material. The provision in the new specifications for stamping the rails to show their position in the ingot will enable us to obtain more definite information on this point in the future.

The attention of the committee has been called to the fact that certain railroads have been keeping this information for some years past and that the results show an excess of failures in the top rails. This information, however, is not conclusive for the purposes of the present investigation, for the reason that these rails were rolled under the old specifications as to discard, and we will be unable to determine definitely the effect of segregation until after we can observe the results of rails rolled under the new specification which will eliminate the rails containing physical defects.

Phosphorus in Bessemer Rails.

In the matter of chemistry specifications for Bessemer steel rail, statistics were obtained from the officers of the Lake Superior Iron Ore Association which convinced the committee that it would be impossible for the mills to furnish more than a small percentage of the total rail requirements of the railroads with a phosphorus specification less than 0.10.

The optional specification for 0.085 phosphorus, prepared by the joint committee of manufacturers and railroad men

is now in the hands of all members, and is therefore available for use by those who are able to obtain low phosphorus Bessemer rails. It is not considered proper, however, to require less than 0.10 phosphorus in a specification intended for general use. Members desiring to obtain low phosphorus rails will have the further option of using open hearth steel. The committee conferred with a number of disinterested experts on both the discard and phosphorus questions, and among the principal authorities consulted were William Metcalf, of Pittsburgh; Robert Forsyth of Chicago, and Prof. Henry M. Howe of Columbia University. These gentlemen all agreed that it would be preferable to test the finished product rather than specify a fixed percentage of discard, and they also agreed that it would be unreasonable to require less than 0.10 phosphorus in a specification for Bessemer rails intended to cover purchases for all American railroads.

The committee has prepared separate specifications for the manufacture of Bessemer and open hearth steel rails, with revised clauses covering discard and chemistry, and the same are submitted herewith.

The New Section.

In the matter of rail sections, the committee, after considering the criticisms and suggestions received in reply to circular No. 768, and after visiting the mills and witnessing the rolling of rails of both the new types of section, are confirmed in their opinion that a change from the A. S. C. E. section is necessary in order to obtain the best results in manufacture, and while they feel that it will be desirable to unite on a single type as the standard of this association, the views expressed by the various members in reply to Circular No. 768 indicate that it will be necessary to provide two types as originally suggested, at least for the present, and pending the time when both of these types can be tried out in actual service.

Some of the replies to Circular No. 768 indicate a fear on the part of certain members that the narrowing of the base proportionate to the hight, made necessary to balance the section and secure work on the head at a lower temperature, would tend to reduce the stability of the rail and increase the cutting of the ties. These points were considered in designing the sections, and it was determined that so far as stability is concerned the sections are well within the limits of safety, and with respect to the cutting of the ties it was felt that the increasing wheel loads of modern traffic necessitate the use of tie plates on curves and soft wood ties in any event.

Ten Pound Intervals.

In considering the necessity for different weights of section, the committee decided in the beginning that it would be sufficient for all reasonable purposes to submit designs for five different weights, increasing from 60 to 100 lb. per yard by 10-lb. increments. The replies to Circular No. 768, however, indicated a desire on the part of a number of the large roads to retain the 85-lb. standard now in quite general use, and such strong demands were made for a section of this weight that the committee felt at one time that it might be necessary to yield on this point, and thus double the number of weights to meet the views of individual members as they had previously doubled the number of types of section for the same cause. Recently, however, some of the important lines have shown a disposition to drop the 85-lb. standard, and as the committee has again been urgently importuned by the manufacturers to hold the railroads in line on this matter, in order to prevent the multiplication of sections which will surely result unless the association takes a firm stand at this time, your committee has determined to hold to its original recommendation in the matter of weights of section, and trusts that the members will see the importance of subordinating personal preferences to the general good. It is quite generally recognized that all reasonable demands can be met by the series of sections herewith submitted, and for roads now using an intermediate weight it will surely be no great hardship to change, when it is considered that they have the option of going either higher or lower than their present standard.

The committee feels that this is an opportune time for action which will tend to reduce the number of types and weights to the minimum, and that if such action is not taken now it will be increasingly difficult to accomplish anything along these lines in the future.

With regard to the relation of the rail to the wheel in its bearing surfaces, the committee had the fullest information from both the mechanical and maintenance of way view points as to results of experience under all conditions, before designing the sections submitted, and while the replies to Circular No. 768 indicate that a few members still favor an increase in the top corner radius, it is believed that the association will be safe in following the recommendation of the committee in this particular.

The committee feels that the main objects of the investigation have been accomplished in the work already done, and that members are now in a position to secure the best rails which can be manufactured in the present state of the art. The adoption of the new and better balanced sections will enable the manufacturers to roll the rails at lower temperatures, thus insuring a finer grain and better wearing quality, as well as reducing the internal stresses. The nearest approach to a single standard type has been arrived at consistent with present engineering knowledge and opinion. Provision has been made for the rejection of all rails containing dangerous physical defects, and means have been provided for keeping accurate records of the rails rolled from different parts of the ingot, and for uniform reports of rail failures, so that accurate information as to the cause of failure will be available in the future.

It will be noted that no reference is made in the specifications submitted to the deflection under drop test, as definite figures can only be inserted after the new sections have been actually rolled and tested. The committee endeavored to obtain this information before submitting the specifications to the association, but a sufficient tonnage of rails of the different weights of each of the new types has not been rolled as yet, and the tests already made indicate that it will be necessary to give the subject quite exhaustive study.

It has been suggested also that the drop test might be made to more nearly approximate conditions obtaining in actual service, and that a further standardization of the details of the apparatus would be desirable. In this connection, the committee has recommended the adoption of a new standard type of anvil which is very much heavier than those used heretofore, and a further revision of the drop test specification may be found necessary after observing the results of a sufficient number of tests under the conditions resulting from this change.

The development of these details, and the following up of the results in service of the new types of section rolled under the new specifications, will require considerable time and much careful study, and, in the opinion of your committee, work of this character can be more efficiently and appropriately handled by the American Railway Engineering and Maintenance of Way Association than by a committee of this association.

In connection with the investigation of the cause of the excessive wear of rails in the London "tubes" since the installation of electric traction, certain experiments have been made in England, both on electric and steam lines, with the high silicon rails advocated by C. Peter Sandberg. The results of these experiments seem to be quite favorable, and the subject should be followed up by the committee of the American Railway Engineering and Maintenance of Way Association.

In conclusion the report makes the following recommendation which the association adopted. It is estimated that about two years will be required for conclusive results in the use of the Type A and Type B sections:

Your committee respectfully recommends that the series of sections of types A and B, and the specifications for Bessemer and open hearth steel rails, submitted with this report, be adopted as the recommended practice of the association, and that the sections and specifications be referred to the American Railway Engineering and Maintenance of Way Association, with the request that they follow up the question of determining the details as to drop test, &c., by observing the actual results of rails rolled under the new sections, and that they also arrange to collect from the different members and tabulate all information as to comparative wear of rails rolled from the different parts of the ingot, and all other information necessary to a proper study of the problem. That they be further requested to keep careful record of the comparative results in service of rails of types A and B, and to prepare and submit to this association a single type of section which will embody their ideas as to the best type that can be designed for use as a single standard to be adopted by this association, giving due weight to every factor entering into the problem.

The specifications for Bessemer steel rails are given below:

Specifications for Bessemer Steel Rails.

The entire process of manufacture and testing shall be in accordance with the best current state of the art, and special care shall be taken to conform to the following instructions:

1. *Process of Manufacture.*—(*a*) Ingots shall be kept in a vertical position until ready to be rolled, or until the metal in the interior has had time to solidify.

(*b*) "Bled" ingots shall not be used. ("Bled ingot": One from the interior of which the liquid steel has been permitted to escape.)

(*c*) There shall be sheared from the end of the bloom formed from the top of the ingot sufficient "discard" to insure sound rails. (All metal from the top of the ingot, whether cut from the bloom or the rail, is the "top discard.")

2. *Chemical Composition.*—The chemical composition of the steel from which the rails are rolled shall be within the following limits:

Bessemer Steel Rails.

	60-lb.	70-lb.	80-lb.	90-lb.	100-lb.
Carbon	0.37 to 0.47	0.40 to 0.50	0.43 to 0.53	0.45 to 0.55	0.46 to 0.56
Manganese	0.80 to 1.10	0.80 to 1.10	0.80 to 1.10	0.85 to 1.15	0.90 to 1.20
Silicon	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20
Phosphorus, not to exceed	0.10	0.10	0.10	0.10	0.10
Sulphur, not to exceed	0.075	0.075	0.075	0.075	0.075

(When lower phosphorus can be secured, a proper proportionate increase in carbon should be made.)

3. *Shrinkage.*—The number of passes and speed of train shall be so regulated that, on leaving the rolls at the final pass, the temperature of the rails will not exceed that which requires a shrinkage allowance at the hot saws, for a 33-ft. rail of 100-lb. section, of 6½ in., and ⅛ in. less for each 10 lb. decrease of section. No artificial means of cooling the steel shall be used between the "leading" and "finishing" passes, nor after the rails leave the finishing rolls; neither shall rails be held before sawing for the purpose of reducing their temperature.

4. *Drop Test.*—The drop testing machine shall have a tup of 2000 lb. weight, the striking face of which shall have a radius of 5 in. The anvil block shall be adequately supported and shall weigh 20,000 lb. The supports shall be a part of or firmly secured to the anvil. The test piece shall be placed head upward on solid supports, 5 in. top radius, 3 ft. between centers, and subjected to impact tests, the tup falling free from the following hights:

60, 70 and 80 lb. rail.....16 ft.
90-lb. rail.....17 ft.
100-lb. rail.....18 ft.

One drop test shall be made on a piece of rail rolled from the top of the ingot, not less than 4 ft. and not more than 6 ft. long, selected by the inspector from each heat of steel. Special or additional tests may be made at the discretion of the inspector. The temperature of the test pieces shall be between 32 and 100 degrees F.

(*a*) If the test piece breaks without showing "pipe" or physical defect, all rails from that heat shall be rejected absolutely.

(*b*) If, however, the test piece broken shows "pipe" or physical defect, the top rail from each ingot of that heat shall be rejected, and

(*c*) A second test shall then be made of a test piece selected by the inspector from a rail other than that from the top of the ingot. If this second piece breaks, the remainder of the rails of the heat shall also be rejected. If this second piece does not break, the remainder of the rails of the heat will be accepted. If the test piece does not break under the drop test, it shall then be tested to destruction, and

(*d*) If, when so tested to destruction, the test piece shows "pipe" or physical defect, the top rail from each ingot shall be rejected; the remainder of the rails of the heat will be accepted.

(*e*) If, when so tested to destruction, the test piece does not show "pipe" or physical defect, all the rails of the heat will be accepted.

5. *Section.*—The section of rail shall conform to the template furnished by the purchaser as accurately as possible consistent with the paragraph relative to specified weight. An excess of 1-32 in. in hight of rails, and a variation of 1-16 in. in width of flange will be permitted, but no variations will be allowed in dimensions affecting the fit of the splice bars.

6. *Weight.*—The weight of the rail shall be maintained as nearly as possible, after complying with the preceding paragraph, to that specified in the contract. A variation of one-half of 1 per cent. from the calculated weight of section, on an entire order, will be allowed. Rails will be accepted and paid for according to actual weight.

7. *Length.*—The standard length of rails shall be 33 ft. Ten per cent. of the entire order will be accepted in shorter lengths varying as follows: 30 ft., 28 ft., 26 ft. and 24 ft. A variation of ¼ in. from the specified length will be allowed. All No. 1 rails less than 33 ft. long shall be painted green on both ends.

8. *Drilling.*—Circular holes for splice bars shall be drilled in accordance with specifications of the purchaser. They shall in every respect conform accurately to drawing and dimensions furnished and must be free from burrs.

9. *Straightening.*—Care must be taken in hot-straightening rails, and it must result in their being left in such condition that they shall not vary throughout their entire length more than 3 in. from a straight line in any direction when delivered to the cold-straightening process. Those which vary beyond that amount, or have short kinks, shall be classed as second quality rails, and be so marked. Rails while on the "hot" beds shall be protected from coming in contact with water or snow. The distance between supports of rails in the gagging press shall not be less than 42 in.; supports to have flat surfaces. Rails shall be straight in line and surface and smooth on head when finished—final straightening being done while cold. They shall be sawed square at ends, variations to be not more than 1-32 in., and prior to shipment shall have the burr caused by the saw cutting removed and the ends made clean.

10. *Branding.*—The name of the maker, the weight of the rail and the month and year of manufacture shall be rolled in raised letters and figures on the side of the web. The number of the heat and a letter indicating the portion of the ingot from which the rail was made shall be plainly stamped on the web of each rail, where it will not be covered by the splice bars. Rails to be lettered consecutively "A," "B," "C," &c., the rail from the top of the ingot being "A." In case of a top discard of 20 or more per cent., letter "A" will be omitted. All rails marked "A" shall be kept separate and be shipped in separate cars.

11. *No. 1 Rails.*—No. 1 rails shall be free from injurious defects and flaws of all kinds.

12. *No. 2 Rails.*—Rails which, by reason of surface imperfections, are not classed as No. 1 rails, shall be considered No. 2 rails, but No. 2 rails shall not be accepted for shipment which have flaws in the head of more than ⅛ in., or in the flange of more than ¼ in., in depth, and these shall not, in the judgment of the inspector, be, in any individual rail, so numerous or of such a character as to render it unfit for recognized No. 2 rail uses. Both ends of No. 2 rails shall be painted white, and shall have two prick punch marks on the side of the web near the end of the rail, so placed as not to be covered by the splice bars. They must be kept separate from No. 1 rails and be shipped in separate cars.

13. *Inspection.*—(*a*) Inspectors representing the purchaser shall have free entry to the works of the manufacturer at all times while the contract is being executed, and shall have all reasonable facilities afforded them by the manufacturer to satisfy them that the rails have been made in accordance with the terms of the specifications.

(*b*) The manufacturer shall, before the rails are shipped, furnish the inspector daily with carbon determinations for each heat, and a complete chemical analysis every 24 hr. representing the average of the other elements contained in the steel for each day and night turn. These analyses shall be made on drillings taken from small test ingots. The drillings for analysis shall be taken from the ladle test ingot at a distance of ¼ in. beneath the surface.

(*c*) All tests and inspection shall be made at the place of manufacture prior to shipment, and so conducted as not to interfere unnecessarily with the operation of the mill. On request of the inspector the manufacturer shall furnish drillings for check analysis.

Specifications for Open Hearth Steel Rails.

Apart from the section relating to chemical composition, the specification for open hearth rails is identical with that for Bessemer rails, with two exceptions. In Section 10 on "Branding," the following sentence precedes what is given above:

All open hearth rails must be marked O. H. to distinguish them from Bessemer rails when in track.

In paragraph (*b*), Section 13, on "Inspection," the first sentence is changed to the following:

The manufacturer shall, before the rails are shipped, furnish the inspector with a complete chemical determination for each heat.

Section 2 in the open hearth specification is as follows:

2. *Chemical Composition.*—The chemical composition of the steel from which the rails are rolled shall be within the following limits:

Open Hearth Steel Rails.

	60-lb.	70-lb.	80-lb.	90-lb.	100-lb.
Carbon	0.50 to 0.60	0.55 to 0.65	0.60 to 0.70	0.65 to 0.75	0.70 to 0.80
Manganese	0.75 to 1.00	0.75 to 1.00	0.75 to 1.00	0.75 to 1.00	0.75 to 1.00
Silicon	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20	0.10 to 0.20
Phosphorus, not to exceed	0.04	0.04	0.04	0.04	0.04
Sulphur, not to exceed	0.06	0.06	0.06	0.06	0.06

(When higher phosphorus is used, a proper proportionate reduction in carbon should be made.)

In accordance with a bill in equity filed by Bertha M. Amsler, W. O. Amsler and A. C. Davis have been named as receivers for the Amsler Engineering Company, engineer and contractor, Diamond Bank Building, Pittsburgh, capitalized at $100,000. It is stated that the company has assets valued at $54,000 and liabilities of $29,950; but, owing to existing financial conditions, it is not able to meet these liabilities at present.

United States Steel Corporation's Earnings.

The statement of the United States Steel Corporation's earnings for the quarter ending March 31, 1908, makes the following showing, as compared with the corresponding period of 1907:

	1908.	1907.
January	$5,052,743	$12,838,703
February	5,709,428	12,145,815
March	7,466,834	14,137,974
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of the subsidiary companies	$18,229,005	$39,122,492
Less charges and appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$291,518	$288,607
Depreciation and reserve funds	1,771,227	3,865,914
Special improvement and replacement funds	.....	1,000,000
	$2,062,745	$5,154,521
Net earnings	$16,166,260	$33,967,971
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$6,000,987	$5,685,615
Sinking funds for the quarter on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds.	298,476	238,848
	$7,311,963	$6,936,963
Balance	$8,854,297	$27,031,008
Dividends for the quarter:		
Preferred, 1¾ per cent	$6,304,919	$6,304,919
Common, ½ per cent	2,541,513	2,541,513
Surplus for the quarter	$7,865	$18,184,576
	Tons.	Tons.
Unfilled orders on hand, March 31	3,765,343	8,043,858

From the surplus of the March quarter of 1907, a special appropriation of $14,500,000 was made for new construction, &c., leaving $3,684,576 as balance of surplus.

The unfilled orders on hand December 31, 1907, were 4,624,553 tons.

The Washington Water Power Company, Spokane, Wash., is extending its 60,000-volt transmission lines to towns in the so-called Big Bend country, west and southwest of Spokane, which in all will include about 92 miles of transmission line. These extensions are designed to furnish power and lighting service to the towns of Reardan, Davenport, Harrington, Sprague, Ritzville and Paha. The work of construction is now under way and will be fully equipped and in operation by the end of the summer. In addition to this work the company is enlarging the capacity of its steam relay power station at Spokane to 20,000 hp., the equipment consisting of Curtis steam turbines. A fifth unit of 3000 hp. is being added to the hydraulic station at Post Falls, Idaho, on the Spokane River, and two 1500-kw. motor generator sets are being installed in the Spokane power station, together with numerous minor additions to the plant equipment.

The Dominion Steel-Coal companies' dispute, which has occupied much attention in the courts of the Dominion of Canada in the last several years, may be settled soon if propositions suggested by London capitalists looking to this end are found favorable and agreeable to both interests. A dispatch from Sydney, N. S., states that the idea of forming a powerful holding company, with a capital of not less than $35,000,000, which will take over both the steel and coal companies and conduct them as one enterprise, is included in a recent announcement from London to parties interested on this side.

Corrigan, McKinney & Co. have decided to begin at once the erection of a new blast furnace to replace their old Scottdale (Pa.) Furnace, which went out of blast last December and has since been torn down. The new stack will have a daily capacity of about 300 tons, and it is expected that it will be ready to blow in about September 1. The contract for the greater part of the construction work has been awarded to the Variety Iron & Steel Works Company, Cleveland.

The Customs Administrative Laws.

Important Amendments Reported to the House.

WASHINGTON, D. C., April 27, 1908.—Half a score of measures proposing changes in the customs administrative statutes have been brought forward in Congress within the past two years, but both House and Senate leaders have been reluctant to take action on any of them in view of the fact that a comprehensive revision of the tariff has seemed to be imminent. The Ways and Means Committee has decided, however, that a substitute bill covering the more important desired reforms in the administrative act of June 10, 1890, should be passed without further delay.

The provisions of the bill thus reported to the House of Representatives extend the time within which a protest against an assessment of duty may be filed from 10 to 15 days; authorize boards of three general appraisers to order rehearings in their discretion; permit appeals to be taken from the Board of General Appraisers directly to the Circuit Court of Appeals, thus eliminating reviews by the circuit courts; require both the importer and the Government to present all evidence to the Board of General Appraisers in the trial of the case before that tribunal; strengthen the tenure of the members of the Board of General Appraisers by forbidding their removal from office except for cause, and after due inquiry; increase the compensation of general appraisers from $7000 to $8000 per annum and clothe the board with power to compel the attendance of witnesses and the production of papers and authorize it to punish witnesses refusing to testify.

The extension of the time within which protests against assessments of duty may be filed from 10 to 15 days is a step in the right direction that will be fully appreciated by importers. It is possible that before the bill is finally acted upon the protest limitation may be increased to 30 days. The authorization to boards of three general appraisers to order rehearings is regarded as absolutely necessary in the interest of justice. Under the present law the decisions of the several subboards are final as to all matters embraced within their jurisdiction, subject only to appeal to the Circuit Court, the full board having no power to correct mistakes other than manifest clerical errors. The power to grant a rehearing is nothing more than the power to correct such errors as the subboards may have committed, and it is believed that in many cases rehearings would promptly and satisfactorily determine issues which can now be settled only after costly litigation in appellate proceedings. The provision that appeals from the board shall be taken directly to the Circuit Court of Appeals has long been advocated by the board and by the Treasury Department. Only questions of law would be carried to the Court of Appeals, and the findings of the board would be final on all questions of fact. The requirement that the importer and the Government shall both present all their evidence to the Board of General Appraisers in the first instance would work a sweeping and most desirable reform. Under the law as it now stands either party may take testimony after an appeal from the board has been taken, and make an entirely new case on evidence which has never been prosented to the attention of the board.

The proposition that the board shall be given power to compel the attendance of witnesses and the production of papers and to punish for contempt has long been contended for by the board, and is approved by the Treasury Department. While importers are not likely to be unanimous in advocating this change, it is a well-known fact that at present the board is powerless to maintain order at its sittings, and cannot compel the attendance of witnesses or the production of evidence, as it cannot enforce such penalties as it may impose.

It is probable that this bill will pass the House before the summer recess, which it is now believed will be taken about May 15, but it is unlikely that it will go through the Senate before next session. W. L. C.

NEWS OF THE WORKS.

Iron and Steel.

Sheridan Furnace, at Sheridan, Lebanon County, Pa., has been blown in after extensive repairs.

The Empire Steel & Iron Company will install six new boilers at its furnace at Topton, Pa. Other improvements are also to be made.

Hall Furnace of Republic Iron & Steel Company, Sharon, Pa., has been banked, having been put in blast on March 1. No. 1 Haselton furnace, in the Mahoning Valley, has also been banked, the company now having only two Haselton furnaces in operation.

It is stated that Struthers Furnace of the Struthers Furnace Company, at Struthers, Ohio, which is now banked, will be blown in at an early date.

General Machinery.

At the annual meeting of the American Machine & Mfg. Company, Charleston, N. C., J. W. Conway was elected president; W. H. Flint, general manager and treasurer; F. W. McComb, assistant secretary, and D. A. Tompkins, consulting engineer. The company is increasing its forces in both foundry and machine shop.

The Jenney Electric Mfg. Company, Indianapolis, has selected a site of 10 acres at Anderson, Ind., near the tracks of the Big Four Railroad and the Indiana Union Traction Company, where it will erect a new plant, the main machine shop of which will be 100 x 400 ft.

Power Plant Equipment.

The Menominee Light & Traction Company, Menominee, Mich., has acquired the necessary rights and will build a hydroelectric plant at Shappee Rapids, the estimated cost of which is $400,000. The current developed from this plant will be transmitted to Menominee, Mich., and Marinette, Wis., for light and power purposes.

The Cobalt Light, Power & Water Company, Ltd., Cobalt, Ont., Canada, has been incorporated with a capital of $10,000. This company is controlled by the Cleveland-Cobalt Silver Mines, Ltd., which furnishes current for the new light plant. The power plant of the Cleveland-Cobalt Silver Mines consists of two 200-hp. Wood & Co. gas producers, three 100-hp. Westinghouse gas engines and one 100-kw. General Electric generator, the latter now being installed. The officers of the new company are A. D. Crooks, president, Toronto, Ont.; S. H. Bradford, vice-president, Toronto, Ont., and F. L. Cody, secretary, Cobalt, Ont.

The Murphysboro Railway, Light, Heat & Power Company, Murphysboro, Ill., has been organized and incorporated with a capital of $36,000, for the purpose of taking over the Murphysboro Street Railway Company, and substituting electric power for the horse traction system now in use. The improvements contemplated will include the extension of the system and the construction of a power plant, with the necessary equipment, all of which must be completed within one year.

From the sales of bonds the city of Alameda, Cal., has provided a fund of $305,000 to be devoted to public improvements. Among the projects embraced in the plans are the building and equipment of a new electric light plant, for which the expenditure of $50,000 is authorized; the construction of a fire engine house, the purchase of fire apparatus, the equipment of reading room in public library with steel shelving, and the erection of a public school building.

The Allis-Chalmers Company, Milwaukee, Wis., which has already installed between 300 and 400 vertical steam driven blowing engines and nearly as many more of the horizontal type for blast furnaces, is installing a new 44 x 84 x 60 in. long cross head blowing engine in the plant of the Tonawanda Iron & Steel Company, North Tonawanda, N. Y., and a unit of the same size in the plant of the Pennsylvania Iron & Coal Company, Cleveland, Ohio. The Republic Iron & Steel Company is installing four pairs of these engines at its Pioneer plant, Thomas, Ala.

The Bedford Power Company has been organized at Indianapolis, Ind., with $50,000 capital stock, which, the incorporators say, will soon be increased to $400,000. The company plans to dam White River near Williams, Ind., and erect a power plant to generate electricity for use at the Bedford Cement Company's plant and at the stone quarries. Among the incorporators are Harry S. New, H. A. Mansfield, James B. Nelson and John W. Holtzman of Indianapolis, Ind.

It is stated that the chief engineer for the Charity Hospital, New Orleans, La., will receive bids until May 20 for the erection of a power house and installation of the necessary boiler capacity to furnish light, heat and power for the hosiptal.

The Borough Council of Etters, Pa., intends to establish a hydraulic electric plant on the Little Conewago Creek to furnish light. About $9000 has been appropriated to erect the plant and install machinery.

The city of East Grand Forks, Minn., has authorized a $50,000 issue of bonds, the proceeds of which shall be applied to the construction of a system of water works. Plans and specifications for this improvement are now being prepared.

The Grand River Light & Power Company, Fort Gibson, Okla., recently organized, has under construction a new electric plant, which will be completed about June 1. The building is of brick, 30 x 50 ft., and motive power will be developed by a producer gas engine equipment.

A contract let April 17 by the city of Farmington, Mo., for the construction of a municipal electric light plant was secured by the Commercial Electrical Supply Company, the price for the plant complete being $23,120. Thomas B. Carter is the engineer in charge.

The installation of a water works system is being contemplated by the city of Winterset, Iowa, and W. K. Palmer, Kansas City, Mo., has been authorized to investigate the water supply and to prepare plans and specifications for the construction of the plant.

Foundries.

The Eaton Rapids Foundry Company, Eaton Rapids, Mich., incorporated with a capital stock of $10,000, has been organized to do a general foundry business and manufacture house heating furnaces. The officers are W. L. Stoddard, president; L. F. Hosler, vice-president and general superintendent; Bert Littell, secretary and manager; H. C. Minnie, treasurer.

Geo. Barcus & Co., Wabash, Ind., have now under construction an important addition to their manufacturing plant, comprising a foundry building, 60 x 220 ft. long, affording about three times the floor space available in their present plant. It is expected that the new building will be completed and ready for occupancy about June 1. The firm does all kinds of gray iron castings and makes a specialty of automobile castings.

W. G. McKenney & Co., Twenty-ninth and Smallman streets, Pittsburgh, are equipping a foundry at Avonmore, Pa., to make sash weights, cast iron washers and other cheap grades of castings. The shop will have a daily capacity of about 30 tons.

The New Phœnix Foundry & Machine Company, Springfield, Mo., is adding a building to its plant, which when completed will practically double its output capacity. Work on the improvement has been begun, and will be pushed to completion. It is the purpose of the company to make the plant modern in every respect, and while equipment for machine shop and foundry is already provided, improved machines will be added from time to time when the remodeled plant is in operation.

Fires.

The sash and blind factory of the Wilbur Corporation, New Haven, Conn., was burned recently, with a loss of $20,000.

Bridges and Buildings.

The McClintic-Marshall Construction Company, Pittsburgh, has nearly completed the erection of a new mixer building at the Bessemer steel plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio.

The Pittsburgh Steel Construction Company, Pittsburgh, Pa., has increased its capital stock from $150,000 to $300,000.

Hardware.

The Consolidated Mfg. Company, room 507, Connecticut Mutual Building, Hartford, Conn., has been incorporated in Connecticut to manufacture specialties, the leading line being the Sanitary crystal ice cream freezer, which has been manufactured for the past two years by the inventor, George H. Fox, Bangor, Me.

The Owosso Mfg. Company, Owosso, Mich., is preparing to enlarge its plant by the erection of a three-story brick building, 80 x 100 ft., to take the place of a one-story frame building to be torn down. Work on this improvement will be begun within the next four weeks.

The A. C. Williams Company, manufacturer of hardware specialties, Ravenna, Ohio, reports its volume of business as very satisfactory. The company's plant is being operated to its full capacity.

The Heffner Mfg. Company, Warren, Ohio, has been incorporated, with a capital stock of $5000, by Harry Heffner and others, to manufacture fireproof thimbles and other specialties.

Herbert Smith, New Haven, Conn., recently manager of the National Wire Corporation, has purchased the finished and unfinished product in the works and is disposing of it to the trade.

Within the next 60 days the American Seeding Machine Company expects to move the entire business of the Kentucky Drill Company Division from Louisville, Ky., to Richmond, Ind., where it wil be merged into the Indiana Division at that place. With a view to this change $200,000 has been spent in enlarging and improving the Richmond plant within the past year. The business of the Louisville factory having outgrown the plant facilities, it became merely a question of building a new factory at Louisville or consolidating the business with one of the larger factories of the company. Being desirous of concentrating its plant operations as much as possible, the company chose the latter alternative.

Miscellaneous.

Vollkommer & Co., 1004 Empire Building, Pittsburgh, manufacturers of enamels and supplies for enameling plants, report considerable improvement in the volume of business being taken. During April more orders were received than in the whole of the three preceding months, which is no doubt due to the opening of spring trade, many of the enameling plants preparing to manufacture their products on a much larger scale.

The Adrian Gas Company, Adrian, Mich., having been reincorporated, a bond mortgage has been issued authorizing $200,000 in bonds, of which $131,000 will be used to take up existing bonds and provide for improvements and extensions, which will be undertaken at once. All contracts in connection with the work contemplated have been arranged for.

The business of the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., which has been placed in the hands of a receiver, is being conducted by Hobart E. French, the receiver, who announces that orders will have the same careful and prompt attention as heretofore.

The National Sanitary Company, recently granted an Ohio charter with a capitalization of $200,000, has purchased 20 acres of land at Salem, Ohio, opposite the Fort Wayne Railroad station, on which it will erect a plant for the manufacture of a complete line of bathtubs, lavatories and other enameled ware. Ground has been broken for two 100 x 450 ft. main buildings, to be of concrete block construction. The boiler equipment will consist of 400 hp. tubular type and the generating equipment of three four-valve Russell automatic engines, direct connected to Northern generators. The plant will embrace a foundry, chipping, enameling and shipping departments, in which all of the machinery will be driven by Northern electric motors. The foundry will have a capacity for melting 35 tons per day.

The American Case & Register Company, Alliance, Ohio, has made plans for building a manufacturing plant at Salem, Ohio. The factory will be of concrete building block, one story in hight, 200 x 500 ft., and there will be an office building 100 ft. square and one story high.

The Trussed Concrete Steel Company, Youngstown, Ohio, made shipments in the past week of about 300 tons of steel in the shape of concrete frame work. Some of this material has been shipped to the Florida East Coast Railroad on its Key West construction, and also for other important work in different localities where solidity of foundation and fireproof construction have been required.

The Scott National Radiator Company, Cambridge, Ohio, has changed its name to the Scott Stove & Furnace Company.

The Irwin Mfg. Company has been organized at Indianapolis, Ind., with $10,000 capital stock, to manufacture automobile accessories. The directors are R. J., M. J. and J. M. Irwin.

The American Paving & Mfg. Company has been organized at Indianapolis, Ind., with $50,000 capital stock, to manufacture paving machinery and appliances. The directors are M. J. Ready, W. J. Mooney and J. G. Mueller.

The capital stock of the Ravenna Gas & Electric Company, Ravenna, Ohio, has been increased from $60,000 to $120,000.

The National Press & Printing Company has been organized at Indianapolis, Ind., with $200,000 capital stock, to manufacture a four-color press, the invention of G. K. Henderson of that city. Associated with him are J. K. Bain, Chas. C. Kuhn and Wm. McBeath.

F. Bowers & Co., Ft. Wayne, Ind., said to be the largest manufacturers of oil tanks in the world, have issued $300,000 of preferred stock to increase their working capital, expecting to do $1,500,000 of business this year.

Bonds in the sum of $40,000 have been authorized by vote of the citizens of Waurika, Okla., for the construction of a water works and sewerage system.

The Ohio-Indiana Pipe & Junk Company, Robinson, Ill., has been incorporated, with a capital stock of $50,000, to deal in oil well supplies and machinery and operate oil and gas wells.

The Rockford Light & Fuel Company, Rockford, Ill., has recently been incorporated by John A. Johnson, Anton E. Carlson and William Johnson. The company manufactures a gasoline gas producer making gas from gasoline for cooking, lighting and power purposes. This equipment is styled the Home gas light machine.

The prohibition wave that has swept over a number of States in the past year has made itself felt in the steel trade. Manufacturers of hoops say that there has been a considerable falling off in the demand for that commodity traceable directly to the lessened operations of breweries and distilleries.

The plant of the Standard Connecting Rod Company, Beaver Falls, Pa., which has been running on short time, has started on a 9-hr. day schedule, with fair prospects ahead.

OBITUARY.

EBEN H. BOURNE, Cleveland, a director in the Bourne-Fuller Company, died April 24 of paralysis, aged 68 years. He was at one time a manufacturer of bolts and nuts, being senior member of the firm of Bourne, Damon & Knowles, formed in 1866. In 1881 this concern was changed to the Bourne & Knowles Mfg. Company, and Mr. Bourne became its president. He was also president of the Cleveland Spring Company and the Columbia Spring Company. In 1884 he became cashier of the Union National Bank and served in that capacity until he succeeded the late Senator M. A. Hanna as president after the latter's death.

ALFRED HABETS, for 30 years the editor of the *Revue Universalle des Mines* of Liege, Belgium, is dead. Born at Liege in 1839, M. Habets graduated with honors in 1863, was appointed tutor of metallurgy at the Ecole des Mines in 1865 and of mining engineering a year later. In 1879 he became professor of mining engineering, a post which he filled to his death. He was closely identified with the Association des Ingenieurs, was a juror at nearly all the great exhibitions and was appointed editor of the Ecole des Mines in 1877. He was secretary for many years of the Union of collieries, mines and metallurgical works of the Province of Liege and was an active member and president of the Geological Society of Belgium.

Dr. EDWIN J. TOOF, New Haven, Conn., president and treasurer of the Edwin J. Toof Company, manufacturer of sewing machines and sewing machine attachments, died April 18, aged 79 years. He was a native of St. Albans, Vt., and studied dentistry, which profession he practiced in Iowa until he went to New Haven in 1870. But a strong bent for mechanics, coupled with inventive genius, led him to move to New Haven in 1870 that he might have manufactured a sewing machine attachment. He became associated with F. P. Pfleghar in manufacturing, the connection being maintained until the establishment of the Edwin J. Toof Company in 1902. He recently disposed of valuable patents to the Greist Mfg. Company, New Haven, but his company continues to manufacture other sewing machine devices. He leaves one daughter.

EUGENE MUNSELL, New York, died early on Saturday morning, April 25, as the result of what is believed to have been an accident. Having been troubled with insomnia for a short time, and feeling the oppression of the weather, he went to the window on the seventh floor of his hotel, and those who knew him best feel sure that through some accident he fell to the pavement, where immediate death ensued. Mr. Munsell came to New York City as a young man to take a place in the stove business which had been conducted for years by his father, and was identified with the stove trade during his entire life, being a large stockholder in the Manhattan Stove Company at the time of his death. His principal interest, however, was a mica business conducted under the name of Eugene Munsell & Co., which had expanded so as to absorb practically his entire attention.

JOSEPH CHRISTOPHER, founder of the Christopher & Simpson Architectural Iron & Foundry Company, St. Louis, died April 22, aged 81 years. He was born in Alsace-Lorraine. For 20 years he was superintendent of the Pullis Brothers Iron Company, now out of existence. He founded the establishment of which he was head in 1873.

Development of water power on the Wolf River, 24 miles from Antigo, Wis., is to be undertaken by the Langlade Power Company, Rhinelander, Wis., which was recently organized by E. A. Forbes, C. A. Wixson, A. W. Shelton and E. D. Sherry. The 4000 hp. which this project is designed to develop will be used to supply current for power purposes, for the transmission of which to Antigo a transmission line will be built.

An employment bureau connected with an important metal trades association refers to the larger number of men called for last week by the shops on its list than for some time. It is suggested that this may mean an expansion of business.

The Iron and Metal Trades

The success of the Pennsylvania Railroad financing, even when allowance is made for exaggerated subscription statistics, has given much encouragement to the Iron trade. It is regarded, with other similar recent transactions as the first tangible proof of returning confidence and as such indicates that more extended buying of materials and supplies by the railroads may soon follow. Leaders in the industry, however, utter the warning that it may take a month or two before the effect is felt in the Steel trade.

The Iron industry is facing problems of its own. The continued pressure to sell Pig Iron, notably in the Central West, which is the principal battle ground of the Western and Southern producers, is creating a serious situation. The proposal made and withdrawn two weeks ago to put Southern Foundry Iron squarely down to $10, at Birmingham, for No. 2, indicates the attitude of some important interests and has had its effect in weakening the market further.

At the meeting at that time it was understood that if developments called for it, there would be a further meeting on the 30th. Instead, a meeting of the Pig Iron and Ore Committees has been called for May 7, and in the interval the majority of the furnaces co-operating are holding to the prices agreed and are selling very little. What Iron is being marketed is at lower prices, and the conviction is growing that prices may drift to the point fixed as likely to check the decline and prepare a sturdy buying movement. As a matter of fact, reports are current even now that $10.25 at Birmingham has been done for a 10,000-ton lot of Pig Iron.

Bessemer Pig has sold in moderate quantities at $16.75 delivered at Pittsburgh, and low figures have been made on Basic Pig. The significance of these developments in the Pig Iron markets is that they may react upon prices of Finished Iron and Steel, since with cheap Scrap and Melting stock they offer inducements to smaller Steel plants and rolling mills.

Aside from one lot of 14,000 tons, which it is expected will be placed at an early date, there is little doing in the Rail trade, and the Plate trade is particularly quiet. A good deal of figuring is going on in Structural Material, but there is some deferring of the contracts, which in some instances is attributed to the hope on the part of the buyers that prices may be lower.

The Tin Plate industry is best employed of all. The American Sheet & Tin Plate Company has 90 per cent. of its capacity in operation, while the other makers are running at the rate of 75 to 80 per cent. There is a better demand, too, for Roofing and Electrical Sheets.

The Copper trade is quiet, the metal selling on the basis of 12.75c. for Electrolytic. The test of stability must come soon, and will depend upon the ability of an increased domestic demand to take up the larger prospective output. The foreign markets have done their share and little more can be expected for a long time to come.

There is a movement among Spelter producers to get rid of a round block of metal abroad, and thus relieve the congestion. Lead has been advanced from 4c. to 4.10c., New York.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr.29, 1908.	Apr.22, 1908.	Mar.25, 1908.	Apr.24, 1907.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	*$17.50*	$17.50	$17.75	$24.50
Foundry No. 2, Southern, Cincinnati	*15.00*	15.25	15.25	24.75
Foundry No. 2, Local, Chicago	*17.35*	17.35	17.50	26.00
Bessemer, Pittsburgh	*17.15*	17.25	17.75	23.85
Gray Forge, Pittsburgh	*15.40*	15.40	15.90	21.85
Lake Superior Charcoal, Chicago	*20.00*	20.00	20.50	26.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	28.00	28.00	28.00	30.50
Forging Billets, Pittsburgh	30.00	30.00	30.00	36.00
Open Hearth Billets, Phila	29.20	29.20	29.20	32.00
Wire Rods, Pittsburgh	35.00	35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago	12.00	12.00	12.00	18.00
Steel Rails, Melting, Phila	12.75	12.75	12.75	19.00
Iron Rails, Chicago	15.00	15.00	15.00	24.50
Iron Rails, Philadelphia	17.00	17.00	17.00	27.00
Car Wheels, Chicago	*13.00*	13.50	15.50	25.00
Car Wheels, Philadelphia	14.00	14.00	14.00	24.00
Heavy Steel Scrap, Pittsburgh	*12.75*	12.75	13.00	17.75
Heavy Steel Scrap, Chicago	*10.75*	11.00	11.25	15.50
Heavy Steel Scrap, Philadelphia	12.75	12.75	12.75	18.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	*1.46*	1.50	1.65	1.83½
Common Iron Bars, Chicago	1.65	1.65	1.65	1.76½
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.80
Steel Bars, Tidewater, New York	1.76	1.76	1.76	1.74½
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.84½
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.70
Beams, Tidewater, New York	1.86	1.86	1.86	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	*1.55*	1.55	1.70	1.85
Skelp, Sheared Steel, Pittsburgh	*1.65*	1.65	1.80	1.90
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	2.05	2.05	2.05	2.00
Cut Nails, Pittsburgh	1.90	1.90	1.90	2.05
Barb Wire, Galv., Pittsburgh	2.50	2.50	2.50	2.45
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	*13.00*	13.00	13.25	25.00
Electrolytic Copper, New York	*12.75*	12 75	13.25	24.25
Spelter, New York	*4.70*	4.65	4.75	6.75
Spelter, St. Louis	**4.57½**	4.50	4.55	6.60
Lead, New York	**4.10**	4.00	4.00	6.10
Lead, St. Louis	**4.00**	3.85	3.85	5.95
Tin, New York	32.25	31.70	32.25	42.00
Antimony, Hallett, New York	*8.75*	8.75	9.50	22.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.89	$3.89	$3.89	$4.09

Chicago.

FISHER BUILDING, April 29, 1908.—(*By Telegraph.*)

Aside from the entry by the principal interest of a fair sized order from the Lake Shore & Michigan Southern for Track Fastenings and an aggregate of 3000 tons of Rails made up of small lots from steam and traction roads, nothing of special interest has developed in railroad purchases. That the roads cannot continue indefinitely to restrict buying as closely as they are now doing is certain, and each week brings nearer the time when they must begin preparations for the coming crop movement. It is generally believed that activity in this direction will give a strong forward impulse to trade in all lines, and signs of its development are therefore being eagerly looked for. The volume of Structural business has fallen off considerably notwithstanding the number of building and bridge projects which are known to be scheduled for construction during the present year. The contracts taken by fabricators last week included only a few small lots, and the chief prospective business developed was the building of piers and wharf sheds by the Government at Fort Mason, San Francisco, which will require about 2000 tons. Plates continue dull and inactive, and the demand for Sheets is not so strong as it has been. In Merchant Pipe the new business entered for the month of April holds about even with that of March, but both Merchant and Locomotive Tubes are extremely quiet. While there are few large requirements for Cast Iron Pipe in sight, there is an increasing number of small orders comprising lots of a few hundred tons coming into the market from the less important towns and cities. A recent order for about

1800 tons of Rerolling Rails placed by a local mill has infused some strength into this division of Scrap material; otherwise the market is weak and sagging and is unsupported by a firm demand from consumers. Despite the many rumors of impending changes in Pig Iron, the situation is not materially altered. There is unquestionably some selling of Southern Iron at below $12, Birmingham, but it is evident from efforts that have been made to place orders at $11.50 that there is not much strictly No. 2 Iron available at this price.

Pig Iron.—In small orders, the bulk of which were under 500 tons, an aggregate of around 3000 tons changed hands in this market during the week. While there was nothing of significance in actual transactions, the number and comparative importance of inquiries received formed the basis for a stronger feeling of encouragement. Among these were one for 1500 tons and one for 1000 tons, which, together with a number of smaller lots, aggregated over 5000 tons, and it is believed that most of these inquiries represent nearby requirements for which purchases must necessarily be made before long. The situation as to prices has undergone no marked change. For No. 2 Foundry $12, Birmingham, continues to be the accepted standard for the majority of Southern producers, although there is some tonnage available at 25c. and possibly 50c. below this figure. Up to the present time, however, the furnaces generally have not been actively seeking business below $11.75, and but few, if any, manifest a desire to contract even at $12 for deliveries extending through the entire second half. One lot of 500 tons of No. 2 Foundry offered at $11.50 resulted in a sale of 200 tons at $12, the buyer withholding the balance of the tonnage in the hope of securing a lower price. Two sales of 100 tons each of Malleable Bessemer are reported, which it notable only because recently there has been absolutely nothing doing in this grade. The Northern furnace situation remains unchanged, with only three blast furnaces active in the Chicago District. These are producing about 750 tons a day, which represents practically 20 per cent. of the capacity of this group. Notwithstanding this reduction, the output is in excess of the demand. The following prices are for May and June delivery, f.o.b. Chicago:

Lake Superior Charcoal	$20.00 to $20.50
Northern Coke Foundry, No. 1	17.85 to 18.35
Northern Coke Foundry, No. 2	17.35 to 17.85
Northern Coke Foundry, No. 3	16.85 to 17.35
Northern Scotch, No. 1	18.35 to 18.85
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.50 to 19.65
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—An extremely quiet demand for the product of forge shops is reflected in the practically stationary condition of Forging Billets, which continue without change as respects either movement or prices. No sales of or inquiries for Billets of any kind are reported, save an occasional lot of insignificant tonnage. We quote Forging Billets at $31.50 to $32.50, Chicago. There is a moderate demand for Wire Rods, but buyers are not disposed to make commitments far ahead of actual requirements. Prices continue without change at the following quotations: Bessemer, $35; Basic, $36; Chain, $37, all at Pittsburgh.

Rails and Track Supplies.—While there have been no further Rail purchases of large tonnage by the principal lines, the past week has developed quite a number of small inquiries from the less important roads and branches, including some traction lines. Several orders of this character booked by the principal interest aggregate 3000 tons, besides which there are pending other requirements ranging from a few hundred up to 1000 tons. It is believed that the imperative needs of maintenance will bring out an increasing number of such orders as the season advances. Some improvement is noted in the demand for Light Rails, and following the recent purchase of rails for the New York Central Lines, some fair sized orders for Fastenings from the Lake Shore & Michigan Southern have been entered by the Illinois Steel Company. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., $28; 20-lb., $29; 16-lb., $30; 12-lb., $31. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Last week's additions to tonnage in the hands of fabricators were light, there being but few of the pending contracts closed, none of which was of considerable importance. Among the minor jobs taken were 700 tons of bridge material from the Chicago, Milwaukee & St. Paul Railway, and two 200-ft. span bridges for California points secured by the American Bridge Company. The general contract for construction of a Y. M. C. A. Building, at Portland, Ore., was taken by J. A. Bowles; the building is to be of reinforced concrete, and will require 500 tons of Steel reinforcing Bars. Most of the inquiries received concern small building projects, but even these are developing slowly. The only new prospective business is a piece of Government work at San Francisco, which involves about 2000 tons for the building of piers and wharf sheds at Fort Mason. The dilatoriness displayed in the placing of several important contracts, known to be fully developed, can only be accounted for upon the theory that they are being held back in the hope of securing the benefit of a reduction in prices. It also seems probable that deferred purchases of Structural Material will have to be made in the near future by some fabricating interests whose commitments will not permit of much longer delay. In the meantime the mills are accumulating specifications slowly, and the local plant is still idle. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—Orders for Plates are not only scarce, but of small tonnage. In fact, there is no buying either by jobbers or manufacturers of anything more than is required for present use. Notwithstanding this condition of affairs, regular prices continue to be maintained except for some concessions that are being made by a few small mills rolling narrow sizes. We quote for mill shipments as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, ¼-in. and heavier, up to 72 in. wide, 2.10c. to 2.20c.; from 72 to 96 in. wide, 2.20c. to 2.30c.; 3-16 in. up to 60 in. wide, 2.20c. to 2.35c.; 72 in. wide, 2.40c. to 2.50c.; No. 8 up to 60 in. wide, 2.20c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—In so far as it was expected that April would show a decided increase in new business over that of the preceding month, the results are disappointing. It is estimated, however, that while there have been no gains the final summing up of totals will show no considerable loss. The demand continues to be solely for small lots for quick shipment. Jobbers report a moderate demand in small orders, but stocks are on the whole moving slowly and are steadily being reduced. Store prices, we are advised, are being fairly well maintained; the only irregularity in mill quotations reported are from one to two small outside producers. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The Bar situation shows no improvement as to demand. Steel Bars are extremely quiet, though specifications on Iron Bar contracts are coming out a little better, with a result that the mills of the Interstate Iron & Steel Company have now been in uninterrupted operation for nearly four weeks. Rerolling mills have been taking some business at extremely low prices, but it is reported that a little more firmness now exists among these interests. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.65c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The tonnage of new business for April will not vary appreciably from that of March, and whatever difference there may be will be on the side of gain. Hand to mouth buying is still being practiced by both jobbers and consumers. Filling in orders of carload lots constitute the average purchase of even the largest distributers. The following mill discounts are quoted: Black Pipe, ¾ to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, ¾ to 6 in., 61.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 71 per cent. on Black

Steel Pipe, ¾ to 6 in. From two to three points above these prices is asked for Iron Pipe.

Boiler Tubes.—All of the principal builders of boilers are working very short handed, and the demand for Merchant Tubes is therefore sharply curtailed. The railroads are likewise taking but few Locomotive Tubes, buying from this source consisting of small lots for repair work. No irregularities of importance are noted in prices, except for some shading done by one or two small mills. Mill quotations for future delivery, on the base sizes, are as follows: 2⅜ to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1¾ to 2¼ in.	50	35	35
2½ in.	32½	35	35
2¾ to 3 in.	60	47½	47½
6 in. and larger	50	35	..

Merchant Steel.—There is little doing in any of the several lines included under this head. New business is confined to a few scattering orders of small tonnage, and specifications are being offered in a halting, reluctant way that indicates no pressing needs on part of manufacturers and jobbers. There is not enough business in Shafting to test fairly the stability of prices, which are reported to be somewhat firmer since the recent revision of discounts. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1½ x ½ in., 1.93c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1⅛ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56 per cent. off in car lots; 52 per cent. less than car lots, base territory delivery.

Cast Iron Pipe.—The bulk of the business now being entered is coming from the smaller municipalities and water works plants, whose requirements rarely exceed a few hundred tons. Owing to the facility with which bonds for such enterprises can now be negotiated locally, a good many improvements of this nature are going forward. Several small lots aggregating about 1000 tons will be up for letting this week in Oklahoma towns. The general contract for the installation of about 350 tons required by the city of Collinsville, Ill., was let last week to T. C. Brooks & Son, Jackson, Mich. No action has yet been taken regarding the proposed advance of 25c. a ton in the rate of freight on Cast Iron Pipe in central territory north of the Ohio River. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25; with $1 extra for Gas Pipe.

Metals.—The entire list of Metals is dull and inactive, there being no demand from any source other than for small lots for immediate consumption. Prices have not sensibly declined, mainly because no attractive business has appeared to tempt concessions. Offerings of Old Metals are light, and, like new material, find a very limited demand from consumers. We quote as follows: Casting Copper, 13¼c.; Lake, 13¾c. to 14c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 33c.; small lots, 33½c.; Lead, Desilverized, 4c. to 4.25c., for 50-ton lots; Corroding, 5.35c. to 5.45c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10½c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is $7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 11c.; Copper Clips, 11c.; Red Brass, 12c.; Yellow Brass, 10¼c.; Light Brass, 6½c.; Lead Pipe, 3¾c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

Old Material.—Practically all of the 4500 tons offered last week by the Great Northern Railroad is reported to have been taken by one dealer at prices close within the range of present quotations. About the only item in the list which exhibits firmness sustained by consumptive demand is Rerolling Steel Rails; some round lots of this material have recently been purchased by local mills, one of which last week brought between 1500 and 1800 tons at $13.50, mill delivery, which is equivalent to practically $13.25, Chicago. Another small lot brought $13.50, Chicago. Influenced by the downward tendency of Pig Iron prices and the scant demand from melters, Cast Scrap is slightly weaker. Because of the absence of transactions in Car Wheels it is difficult to get a line on the true level of prices. One Western road is offering 3400 Wheels on which it has signified its willingness to accept $14 a ton, but so far without result. It is evident from the tenders of Melting stock being made by country dealers that they are becoming anxious to unload their holdings. Within the past few days one dealer has received offers on upward of 5000 tons of such material from outside sources. Much of this stock has been held for some time in the hope of realizing on an advance, but the present eagerness to sell would indicate that these interests are losing faith in the appearance of early improvement. No tonnage is being offered this week by the railroads. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails	$15.00 to $15 50
Old Steel Rails, rerolling	13.00 to 13.50
Old Steel Rails, less than 3 ft.	12.00 to 12.50
Relaying Rails, standard sections, subject to inspection	20.50 to 21.50
Old Car Wheels	13.00 to 13.50
Heavy Melting Steel Scrap	10.75 to 11.25
Frogs, Switches and guards, cut apart	11.50 to 12.00
Mixed Steel	9.00 to 9.50

The following quotations are per net ton:

Iron Fish Plates	$13.00 to $13.50
Iron Car Axles	16.00 to 16.50
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	11.00 to 11.50
No. 2 Railroad Wrought	10.00 to 10.50
Railway Springs	11.00 to 11.50
Locomotive Tires, smooth	13.00 to 13.50
No. 1 Dealers' Forge	9.00 to 9.50
Mixed Busheling	7.00 to 7.50
Iron Axle Turnings	5.75 to 6.25
Soft Steel Axle Turnings	5.75 to 6.25
Machine Shop Turnings	5.25 to 6.25
Cast Borings	4.50 to 5.00
Mixed Borings, &c	4.50 to 5.00
No. 1 Mill	6.75 to 7.25
No. 2 Mill	5.75 to 6.25
No. 1 Boilers, cut to Sheets and Rings	7.00 to 7.50
No. 1 Cast Scrap	11.75 to 12.25
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00
Pipes and Flues	7.75 to 8.25

The Chicago offices of Rogers, Brown & Co. have been moved from the Monadnock Block to the new Corn Exchange Bank Building, northwest corner of La Salle and Adams streets. A suite comprising rooms 1515 to 1530 on the fifteenth floor will be occupied by the firm.

Pittsburgh.

PARK BUILDING, April 29, 1908.—(*By Telegraph.*)

Pig Iron.—A feature of the market is the scarcity of Basic Iron for prompt shipment, and the price of $15.50, Valley furnace, is firmer than it has been for some time. Only one stack in the two valleys is running on Basic, and the consumption seems to be larger than the supply. Sales of Bessemer Iron continue to be only small lots for prompt shipment, but in a general way there is more inquiry. We quote Bessemer Iron at $16.25, Valley furnace, or $17.15, Pittsburgh. There have been some fair sized sales of Foundry Iron, but at low prices. The Westinghouse Electric & Mfg. Company has bought 300 tons of Foundry on the basis of $14.70, Valley furnace, for No. 2, while we note other sales of about 1200 tons of Northern No. 2 Foundry at $14.75, Valley furnace, or $15.65, Pittsburgh. We quote Northern No. 2 Foundry at $14.75 to $15, Valley furnace, some sellers refusing to shade the higher price. We quote Northern Forge Iron nominally at $14.50, Valley furnace, or $15.40 Pittsburgh.

Steel.—The Carnegie Steel Company and other makers of Sheet and Tin Bars report they are quite busy on these, but there is no demand for Billets and specifications against contracts are only fair. Regular prices, which the mills insist are being maintained, are $28, Pittsburgh, and $28.50, Youngstown or Wheeling, for Bessemer or Open Hearth Billets, while Sheet and Tin Bars take an advance over these prices of $1 a ton. Forging Billets are very dull, and are nominally $30, Pittsburgh.

Ferromanganese.—In the last few days the market has advanced about $1 a ton, and best grades of foreign 80 per cent. are now held at $43, at seaboard, or $44.95, Pittsburgh. There is a greatly improved inquiry.

(*By Mail.*)

Reports from agents in the West and Northwest of local Steel companies are to the effect that conditions in the Iron trade are showing betterment, but in the territory east of Chicago there has been no improvement. However, an encouraging feature is that there are more inquiries and consumers of Pig Iron are writing in asking for quotations on fair sized lots for delivery three or four months ahead. This is the first time in some months that this has been the case, and indicates clearly that consumers are more interested in the market. As yet actual sales of Pig Iron are mostly of small lots, although in the past week one local foundry has bought 1000 tons and another 300 tons of Foundry Iron, but at very low prices, lower than have been made in this market at any time since the decline started. Shipments of Pig Iron from the valleys for some weeks have been slightly larger than the output, and stocks have been gradually decreased. There is practically no demand for Billets, but the Carnegie Steel Company and other producers are fairly busy on Sheet and Tin Bars. In Finished Iron and Steel new business continues disappointing. While the demand for Tin Plate, Sheets, Pipe and Wire products is fairly active, this is offset to a large extent by the falling off in Structural Shapes, Plates and other forms of Finished Steel. The Coke trade is nearly stagnant. While some Scrap is moving, it has

been at the expense of prices, which are lower than for some time. The most encouraging feature in the general situation is the successful marketing of bonds by railroads, indicating that the financial situation has decidedly improved. The agricultural outlook is promising, and if the hope of good crops is realized it will do much to help the Iron trade as well as general business.

Muck Bar.—Spang, Chalfant & Co. have started up their Muck Bar mill, but will not sell any of the product in the open market, using it in their own Pipe mills. We do not hear of any sales of or inquiry for Muck Bar. We quote best grades made from all Pig Iron at nominally $27, Pittsburgh, but if any business was offering this price could be shaded.

Skelp.—The market is quiet, but there is fair specifying against contracts. Quite a number of Pipe mills are shut down for lack of orders, and this naturally decreases the demand for Skelp, which has been dull for some months. We quote Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

Rods.—There is only a light inquiry, and sales are in small lots for nearby requirements. We continue to quote Bessemer Rods at $35, Open Hearth at $36 and Chain Rods at $37, f.o.b., Pittsburgh.

Steel Rails.—No orders of moment either for Standard Sections or Light Rails have been placed during the week. The three Edgar Thomson Rail mills of the Carnegie Steel Company, at Bessemer, are in operation, but are gaited to 35 per cent. or less of capacity. Regular prices on Light Rails, which continue to be shaded from $3 to $4 a ton by rerolling mills, are as follows: 25 to 45 lb. Sections, $28; 20-lb., $29; 16-lb., $30, and 12-lb., $32. We quote Standard Sections at $28, at mill, and Angle Splice Bars at 1.65c., at mill.

Plates.—Only routine orders for actual needs are being placed, the amount of new business going to mills being light. Inquiries for some Plates for Riveted Pipe for water lines are in the market. Prices are well maintained on wide Plates, but on narrow sizes are shaded $1 to $2 a ton by some mills. Regular prices are as follows: Tank Plates, ¼-in. thick, 6¼ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edges	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell grade of steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes, 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—A fair amount of work is in sight, but it is developing slowly. Reports are that very low prices are still being made on fabricated material, and that in some cases it has been furnished at very close to regular prices of plain material. We quote Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x ¼ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—There has been a perceptible increase in the demand for roofing and electrical Sheets, shipments of the mills on these grades being heavier than for some time. The demand for Black and Galvanized Sheets is also showing a slight betterment. Prices in the main are being held, but are sometimes shaded by a few mills that absorb part of the freight. Regular prices are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, $1.75 per square, and Galvanized Roofing Sheets, No. 28, $3.10 per square, for 2½-in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Cotton Ties.—Purchases of Cotton Ties do not compare favorably in volume with last year, and it is not believed that the demand will be equal to that of 1907. A good many contracts have been placed on which buyers are now specifying. We quote as follows: 3000 bundle lots and over, 85c.; less than 3000 bundle lots, 88c., f.o.b. Pittsburgh.

Hoops and Bands.—A fair tonnage against specifications is being received by the mills, but practically no new orders are being placed, buyers having covered themselves last January, when the mills guaranteed prices against decline. Regular prices are as follows: Steel Hoops at $2, base, full Hoop card extras; Steel Bands, $1.60, base, half Steel card extras, all f.o.b. cars, Pittsburgh, Pa., in carload lots, for delivery during 1908.

Tin Plate.—The American Sheet & Tin Plate Company has started its Demmler Works, at McKeesport, Pa., because of the heavier demand for Tin Plate, and is now operating upward of 90 per cent. of its total capacity. The independent mills are also doing better and are operating on an average of 75 to 80 per cent., so that present conditions in the Tin Plate trade, when compared with other lines, are quite satisfactory. Persistent reports that prices of Tin Plate were being shaded by rebates from the mills and other ways are strongly denied, the statement being made that official prices are being absolutely maintained. The outlook is for a good fruit year, and if nothing untoward happens to blight the prospects of business from the canning trade the Tin Plate mills expect that the demand for their product will be equal to or larger than that of last year. We quote at $3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Iron and Steel Bars.—A slightly better demand for both Iron and Steel Bars is noted, and we are advised by one or two leading mills that specifications against contracts are coming in much better. It is estimated that about 40 per cent. of the entire capacity of the country in Iron and Steel Bars is active at present, this being somewhat larger than in the early part of the year. The demand is mostly for small lots for actual needs of consumers, there being no disposition on the part of the large trade to contract ahead. While it is possible that a few small mills are shading the price of Iron Bars, it is stated that the leading producers are absolutely adhering to regular prices. There is also a report that the price of 1.60c., Pittsburgh, on Steel Bars is being shaded, but if this is true it is only by small mills that do not make a full assortment of sizes. We quote Iron Bars at 1.50c. for the Pittsburgh District, and 1.47c., Pittsburgh, for Chicago and points further west. Steel Bars remain very firm, at 1.60c., Pittsburgh.

Spelter.—Business is unusually light, and the tone of the market is weak. We quote prime grades of Western Spelter at 4.45c., East St. Louis, equal to 4.57½c., Pittsburgh.

Railroad Spikes.—The expected betterment in demand has not materialized, and new business in Railroad Spikes is quite small. We quote: Standard sizes, 4½ x 9-16 in., at $1.70, and the smaller sizes at $1.80 per 100 lb. in carloads and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—New business is confined to small, scattering orders, while specifications against contracts are light and disappointing. Not enough is being sold to test prices, which on the whole are weak. We quote Cold Rolled Shafting, on contracts for 100 tons and over, 57 per cent. off; carloads, 56 per cent. off, and less than carloads, 52 per cent. off, on which carload freight is allowed within base territory. Nominal prices on Merchant Steel are as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 2.10c. to 2.15c. Railroad Spring Steel, 1.60c. to 1.75c., the higher price being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron, finished, 1½ in. and wider, 1.60c.; under 1½ in., 1.75c. Planished Tire Steel is 1.80c., all f.o.b. at mill.

Boiler Tubes.—There is a little more business being placed with the mills, actual orders in April showing a slight increase over March. Discounts on Merchant Tubes for small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ in.	42	47
1¾ to 2¼ in.	42	59
2½ in.	47	61
2¾ to 5 in.	52	65
6 to 13 in.	42	59

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Pipes and Tubes.—The demand for Galvanized Merchant Pipe is better than for some time. The large jobbing trade has been notified that there will be no change in prices for some time, and with this assurance from the mills new business is being placed a little more freely. Several fairly large Pipe lines are in the market, but the difficulty of getting these projects financed is holding them back. In some

cases mills have been offered payment in notes and other securities for projected Pipe lines that they have turned down. We are advised that regular prices are being maintained. Net discounts on Steel Pipe to the large trade on ¾ to 6 in. remain at 74 and 5 per cent. off list, while on Iron Pipe the absolute minimum is 72 and 5 per cent. Discounts on Steel Pipe are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black. %	Galv. %
⅛ to ¼ in	65	49
⅜ in	67	53
½ in	69	57
¾ to 6 in	73	63
7 to 12 in	70	55
Extra strong, plain ends:		
⅛ to ⅜ in	58	46
½ to 4 in	65	53
4½ to 8 in	61	49
Double extra strong, plain ends:		
½ to 8 in	54	43

Discounts on Genuine Iron Pipe are as follows:

	Black. %	Galv. %
⅛ and ¼ in	63	..
⅜ in	65	51
½ in	67	55
¾ to 6 in	71	61
7 to 12 in	68	53
Extra strong, plain ends:		
⅛ to ⅜ in	56	44
½ to 4 in	63	51
4½ to 8 in	59	47
Double extra strong, plain ends:		
½ to 8 in	52	41

Coke.—The output of Coke last week was about the same as in the previous week, the product of the Upper and Lower Connellsville regions having been 147,786 tons. There are 37,474 ovens in these two regions, of which 14,265 were active last week. In the Coke districts outside the Connellsville region the percentage of ovens in blast is much less and is not over 25 per cent. There is practically no demand for Furnace Coke, but occasionally some is sold for spot shipment, mostly Coke that is loaded on cars and has to be moved. Best grades of Furnace Coke for prompt shipment can be bought at $1.50 to $1.60, but other grades made outside the Connellsville region are sold as low as $1.35 to $1.40 at oven. Foundry Coke of the best grades is $2.10 to $2.25, and other makes are offered as low as $1.90, at oven. It is stated that a number of Coke concerns have about decided to blow out their ovens and keep them down until the demand materially improves.

Iron and Steel Scrap.—There is no improvement in demand, and the tone of the market is weak. Large consumers of Scrap like the La Belle Iron Works, Sharon Steel Hoop Company, Republic and others are running their finishing mills only intermittently, and this reduces very much the consumption of Scrap. One leading consumer came in the market recently and bought a fairly large tonnage for delivery over the next two or three months at relatively low prices. There has been an accumulation of Bundled Sheet Scrap, due to the fact that the Sheet mills are making better time than other Scrap producing plants, with the result that some low prices have recently been made. It is estimated that in the last month there have been sales of upward of 15,000 tons of Bundled Sheet Scrap sold by mills to Open Hearth plants at prices equal to about $8.50 at shipping point. Dealers quote other grades of Scrap as follows, per gross ton, at Pittsburgh, except as otherwise noted: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, $12.75 to $13; Cast Borings, $7.25 to $7.50; No. 1 Railroad Wrought, $13.25 to $13.50; No. 1 Cast, $14.25 to $14.50; Bundled Sheet Scrap, $8.50 to $9, at shipping point; Sheet Bar Crop Ends, $16 to $16.50; No. 1 Busheling Scrap, $12 to $12.25; No. 2, $9 to $9.25; Iron Axles, $19 to $19.50; Steel Axles, $16.50 to $17; Low Phosphorus Melting Stock, $16; Old Steel Rails, short pieces for Open Hearth use, $12.75 to $13; Rerolling rails, lower in price, $13.50 to $13.75; Machine Shop Turnings, $8 to $8.25; Grate Bars, $12 to $12.50; Railroad Malleable Scrap, $11.25 to $12. We note sales of upward of 1000 tons of No. 1 Busheling Scrap at a price equal to about $12, Pittsburgh; about 500 tons of No. 2 at about $9.25, Pittsburgh; 800 to 1000 tons of No. 1 Railroad Wrought Scrap at a price equal to about $13.25; 500 tons of Machine Shop Turnings at $8, Pittsburgh, and about 600 tons of Cast Borings at a price equal to about $7.75, Pittsburgh.

St. Louis.

ST. LOUIS, MO., April 27, 1908.

In a general way, it may be fairly stated that the situation is a little brighter, though far from normal. The consensus of opinion, however, is in the direction of a slow but steady gain.

Coke.—There is no material change in the demand, though contract customers are taking Coke faster in specifications. For future shipment, however, there is some improvement.

Pig Iron.—The inquiry is better, and the actual tonnage placed last week was larger than had been booked for some time. The Medart Patent Pulley Company, it is reported, placed an order for 1200 tons of Southern No. 1 Soft for shipment over last half. It is reported that an order for 1000 tons was closed for the vicinity of St. Louis, and an inquiry is out for 500 tons for third quarter.

Finished Steel.—The inquiry for finished product in any line is only for special requirements. The requisitions for assorted Bars and Shafting are light. Some of the railroads, it is said, are sending out dummy requisitions not representing actual needs, but for the purpose of getting prices. There being but little new work, the call for Tank and Boiler Plates is light, though there are indications of more doing in the near future. For Structural Material there is a quite a satisfactory inquiry, but no large tonnage is involved, being rather the aggregate of a number of small structures. The orders for the larger new jobs have not yet been placed. Bar specifications are now coming in better, owing to jobbers replenishing stocks, both as regards the local and outside trade. The inquiry for Rails is much larger than has been the case for some months.

Old Material.—The demand is in better shape, especially for Old Rails. Rerolling Rails are in good demand and railroads are offering less stock than the manufacturers are consuming at the present time. There is also a better demand for Car Wheels. With respect to Rails, it is reported that, in part, the demand is from dealers to cover sales made earlier in the season. We understand a leading St. Louis house has purchased about 2500 tons of 56-lb. Relaying Rails from a trunk line for Western delivery. Quotations are as follows, f.o.b. St. Louis, per gross ton:

Old Iron Rails	$15.25 to $15.75
Old Steel Rails, rerolling	11.50 to 12.00
Old Steel Rails, less than 3 ft	11.50 to 12.00
Relaying Rails, standard sections, subject to inspection	22.50 to 23.50
Old Car Wheels	14.50 to 15.00
Heavy Melting Steel Scrap	11.50 to 12.00
Frogs, Switches, Guards, cut apart	11.50
Mixed Steel	10.25

Following quotations are per net ton:

Iron Fish Plates	$12.50 to $13.00
Iron Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	11.75 to 12.25
No. 2 Railroad Wrought	10.75 to 11.25
Railway Springs	10.50 to 11.00
Locomotive Tires, smooth	12.75 to 13.25
No. 1 Dealers' Forge	9.00 to 10.00
Mixed Borings, etc	3.50 to 4.00
No. 1 Boilers, cut to Sheets and Rings	8.50 to 9.00
No. 1 Cast Scrap	11.50 to 12.00
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	9.50 to 10.00
Agricultural Malleable	8.50 to 9.00
Pipes and Flues	8.75 to 9.25

Birmingham.

BIRMINGHAM, ALA., April 27, 1908.

Pig Iron.—Producers are more encouraged by reason of favorable reports on the condition of foundry trades and the fact that such reports are substantiated by larger proportions of inquiries, but the transactions recorded fail to indicate that the feeling of uncertainty as to prices, which has been such a prominent feature for months past, has disappeared. With the exception of one of the largest concerns, which has been practically out of the market for some time past, the schedule of $12, Birmingham, for No. 2 Foundry is established by all producers, but numerous reports are rife of offerings at lower figures, and in the absence of a firm demand for tonnage sufficient to test the strength of the market it cannot be definitely stated just what price could be had. Carload lots of No. 2 are frequently sold for $12, but lower grades have brought figures that would indicate $12.50 on a No. 2 basis. The instances referred to are a sale of Gray Forge at $10.75, furnace delivery, and an offer for 750 tons of No. 4 Foundry, which was declined by reason of a difference of 25c. per ton between the parties. It is to be noted that practically all accumulations of low grades in the district have been depleted. The sale of approximately 2100 tons of High Manganese Iron is reported at figures equivalent to $12 to $12.50 for No. 2 Foundry, and a recent sale of Charcoal Iron was made at $20 at furnace. The quantity engaged was 300 tons. Among the inquiries for Foundry Iron now pending are 3000 tons for delivery during the next three months, 2000 tons for third quarter delivery, and 1000 tons for delivery covering the remainder of the year. The only quotation known to have been made so far was on the first lot mentioned, which was $12, Birmingham. The concern that made the quotation, however, has practically no stock on furnace yards, and its order books are believed to be in good shape for advanced deliveries.

Cast Iron Pipe.—Within the week the tonnage placed in this district was comparatively small, but the outlook is still favorable, and there is no indication that capacity recently

put in operation will be suspended. The announcement that $5,000,000 in bonds will be issued by the city of San Francisco May 11 for water works extensions is received with satisfaction by Southern producers, and specifications for the material required will be awaited with interest. There are also three orders aggregating a significant tonnage for Cuban points to be placed upon satisfactory arrangement as to finances. The tonnage soon to be placed for Mexico is attractive, the points expected to enter the market being Pueblo and San Luis Potosi. A change in quotations is not authorized, and nominal quotations on Water Pipe are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for Gas Pipe. These quotations are probably shaded on large contracts.

Old Material.—The Wrought and Cast Scrap as well as Stove Plate required by local foundries reaches fair proportions, but the demand for other grades is exceptionally light. Dealers manifest no disposition to force a market by making concessions, but in view of a declining Pig Iron market, the maintenance of present quotations is hardly probable. The absence of transactions prevents a revision of quotations. We quote nominally as follows, per gross ton, f.o.b. cars here:

Old Iron Rails	$16.00 to $16.50
Old Iron Axles	15.00 to 15.50
Old Steel Axles	13.50 to 14.00
No. 1 Railroad Wrought	13.00 to 13.50
No. 2 Railroad Wrought	10.00 to 10.50
No. 1 Country Wrought	11.50 to 12.00
No. 2 Country Wrought	10.50 to 11.00
Wrought Pipe and Flues	9.50 to 10.00
No. 1 Steel	11.00 to 11.50
No. 1 Machinery	10.50 to 11.00
Stove Plate and Light Cast	9.50 to 10.00
Cast Borings	6.00 to 6.50

Philadelphia.

PHILADELPHIA, PA., April 28, 1908.

Buying of both crude and finished materials during the past week has been practically at a standstill. Consumers who have not been compelled from necessity to make purchases have been withholding their business pending further action regarding the price of Pig Iron, the general opinion being that lower prices will prevail, and should this take place a readjustment of prices all along the line is anticipated. The ease with which the Pennsylvania Railroad has floated its $40,000,000 bond issue and the city of Philadelphia an issue of nearly $6,000,000 is encouraging from a financial standpoint. While a large portion of the railroad funds is to be applied for the completion of work already under way, that for the city will include a good share of new work. Hope is expressed that the success of these flotations will result in awakening interest on the part of railroads and industrial concerns as far as the completion of some of the work held up last fall is concerned.

Pig Iron.—The market has been extremely dull and buying, except in cases where it is absolutely necessary, has been pretty generally held up. Melters are inclined to withhold placing business, even for moderate tonnages, until the question of prices becomes more settled. Under the existing circumstances these cannot go higher, and if there is a reduction, of which there seems to be a strong probability, consumers wish to be in a position to take advantage of the lower price. Producers in the Schulykill and Lehigh valleys are still holding the base price, $18.25, delivered, for No. 2 X Foundry, and would not be able to meet the prices suggested recently by some of the Southern interests, and should the prices made by the latter prevail most of the few furnaces still in blast in this territory would be forced to blow out. Outside interests continue to take the bulk of the business offered at prices, which are practically unchanged, and which range from 50c. to $1 below the regular prices. We learn of no further shading on the part of the outside furnaces in the East nor of the Virginia furnaces. What would be done, however, if a good tonnage came out would be difficult to say, but it is intimated that if further concessions were necessary to land desirable specifications there would no doubt be furnaces that would shade their present rates. The Southern furnaces dominate the market at the present time. While there has been no very large business offered, it is reported that some Southern interests would be willing to cut $12, f.o.b. Birmingham, 50c. a ton for desirable orders. The Pipe interests are in the market for their usual tonnages of a few thousand tons, which at to-day's prices are generally taken by the Southern interests. The greater proportion of the orders taken in this territory has been for Foundry Irons, usually small lots of No. 2 X and No. 2 Plain, sales of which grades have been made by both inside and outside interests. There has been a little inquiry for Forge Iron, but no business of any moment has resulted. The Steel making Irons are a drug on the market. Until there is something more definite available regarding prices, the market for Pig Iron will no doubt continue dull and uninteresting. Prices during the week show but little change, the market not having been seriously tested. We quote the following range for delivery during the remainder of the second quarter, in buyers' yards, eastern Pennsylvania and nearby territory:

Eastern Pennsylvania, No. 2 X Foundry	$17.50 to $18.25
Eastern Pennsylvania, No. 2 Plain	17.00 to 17.75
Virginia, No. 2 X Foundry	17.50 to 17.75
Virginia, No. 2 Plain	17.00 to 17.25
Gray Forge	16.00 to 16.75
Basic	17.25
Low Phosphorus	23.00 to 23.50

Ferromanganese.—The demand has been extremely light, and buyers show but little interest. What business has been done was confined to odd lots for prompt shipments. Prices ranging from $43 to $44, Baltimore, are named, but it is believed that these would be shaded if desirable orders were to be had.

Steel.—New orders are few, and specifications on contracts are comparatively light. Mills are just about holding their own, although in some cases stocks are increasing materially. Practically all the business taken is for prompt shipment. Prices are being maintained for Philadelphia delivery, $29.20 being named for ordinary Rolling Steel, and $31.20 for Forging Steel with the usual extras for high carbons and large sizes.

Plates.—The business coming out is small. Orders are fairly numerous, but still confined to small quantities, individually, so that mills do not gain any in tonnage on their books. Large orders are scarce, and the outlook is hardly as good as it was some weeks ago. Prices are unchanged. We quote the following range for delivery in this territory:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Commercial Firebox	2.05	2.10
Marine	2.25	2.30
Locomotive Firebox Steel	2.35	2.40

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 lb.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—A fairly even run of business continues to come out, most of which, however, is small. The Belmont Iron Works received a contract for the Structural work in connection with the Athletic Baseball Club's new grand stands, requiring some 500 tons. Other contracts were taken by the same company for bridge work in connection with the elevation of the tracks of the Pennsylvania Railroad in Camden, N. J. Inquiry has shown a little improvement, and revised estimates are being asked in some cases for work which was held up last fall. There is some talk of the erection of a large hotel in Atlantic City, N. J., but definite information is not yet available. The actual volume of new business is small and mills are not making any material gains in tonnage. Prices continue unchanged, 1.85c. to 2c. being named, according to specifications.

Sheets.—Business continues largely of a day to day character, and mills are just about able to maintain their output of 50 per cent. of the capacity. Orders are mostly for prompt shipment, there being practically no buying for forward delivery. Quotations range as follows, for mill shipments, with a tenth extra for small lots: Nos, 18 to 20, 2.50c.; No. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Specifications on some of the low priced contracts for Bars have been coming out a little more freely, but very little business is being taken by mills at the established basis of 1.65c., delivered, for Refined Iron Bars. Quotations as low as 1.40c., Eastern mill, are still being made by merchants, and orders are reported as being taken at from 1.46c. to 1.57c., delivered. Mills are not very actively engaged, and have but little business ahead, buyers taking only such quantities as are needed for immediate use.

Coke.—Coke has been particularly quiet. Some few sales of Foundry Coke have been made at prevailing prices, but Furnace Coke is in light demand. Foundry Coke is quoted at $2.15 to $2.40 at oven, and Furnace Coke at $1.65 to $1.85 at oven. We quote the following range of prices for delivery in the Philadelphia territory:

Connellsville Furnace Coke	$3.80 to $4.00
Foundry Coke	4.30 to 4.55
Mountain Furnace Coke	3.40 to 3.60
Foundry Coke	3.80 to 4.10

Old Material.—The demand is light. Sales have been confined to odd lots for prompt shipment. Mills are taking no interest in the market and the trade is practically at a standstill. Not enough business has been done to establish quotations, and the tendency, if anything, is weaker. We

quote nominally for prompt delivery in buyers' yards, eastern Pennsylvania and adjoining territory, about as follows:

No. 1 Steel Scrap and Crops	$12.75 to $13.25
Low Phosphorus	17.50 to 18.00
Old Steel Axles	17.50 to 18.00
Old Iron Axles	20.00 to 21.00
Old Iron Rails	17.00 to 18.00
Old Car Wheels	14.00 to 15.00
Choice No. 1 R. R. Wrought	15.00 to 15.50
Machinery Cast	15.00 to 15.50
Wrought Iron Pipe	11.50 to 12.00
No. 1 Forge Fire Scrap	11.50 to 12.00
No. 2 Light Iron	9.00 to 10.00
Wrought Turnings	8.75 to 9.25
Stove Plate	11.00 to 11.50
Cast Borings	7.50 to 8.00
Grate Bars	11.75 to 12.25

Cleveland.

CLEVELAND, OHIO, April 28, 1908.

Iron Ore.—Several rather indefinite inquiries for Ore have been received by the merchant firms during the past week, but it is believed that the inquiries were made more for the purpose of testing the market than with the idea of making any purchases at present. Efforts are still being made by some of the furnace interests to induce shippers to reduce the price of Ore, but with conditions as they are the Ore men do not expect much if any buying before well along in June, and for the present at least will not take up the matter of reconsidering prices. Those who are most active in urging lower prices are the furnace interests that have been able to keep their stacks in operation, and do not have a large quantity of last season's Ore still on hand. As an argument in favor of lower prices they say that with a reduction of $1 a ton on Ore the Northern furnaces will be able to meet any competition on the part of Southern producers should the latter decide to make further reductions in the price of Pig Iron. Navigation has opened on the lakes, but only a few boats have been started. The large freighters have not yet been fitted up, and according to the present outlook the movement of Ore down the lakes will not start until about July 1. It had been the intenion to begin shipments about June 1, but it does not look as if there would be any cargoes ready by that time. Vesselmen say that even if the start is delayed until July 1 the boats will have no trouble in bringing down all the Ore that is needed before the close of navigation. Nothing has been done as yet in regard to fixing the Ore carrying charges for the season. Following the action of the dock managers at Lake Erie ports last week declaring for the open shop on the Ore and Coal docks, there has been considerable increase in the shipments of Ore from the docks to the furnace yards. The agreement between the dock managers and the 'longshoremen expires May 1, and the open shop policy goes into effect on that date. In view of a possibility of labor troubles, some of the furnace interests have been rushing considerable Ore from the docks to the furnace yards during the past few days. Prices for 1908 delivery at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4; Siliceous Bessemer, $2.75; Siliceous Non-Bessemer, $2.35 to $2.60.

Pig Iron.—There is no improvement in the demand. The $15 price of No. 2 Northern Foundry, Valley furnace, has been shaded slightly in some sales. A report that appeared in another publication last week to the effect that a Cleveland foundry had bought 1000 tons of Northern No. 1 Foundry on the basis of $14.45, Valley furnace, for No. 2, proves incorrect. There is practically no demand for Foundry Iron in this territory, even in car lots, but a few good inquiries have come into the market during the week from other territories. There is one inquiry for 2000 tons of No. 2 Northern Foundry from a consumer in the Buffalo District, the delivery of 500 tons wanted per month for four months. There have also been several inquiries for Foundry Iron for last half delivery. Some of these inquiries have come from the East, others from Ohio, and one from western Pennsylvania. Some of these inquiries, however, are believed to have been made for the purpose of testing the market. In reply to inquiries a local furnace is quoting No. 2 Foundry at $16, furnace, for last half delivery. Furnaces are not disposed to quote the present low prices for delivery to cover the balance of the year. For Cleveland delivery local furnaces are asking $16.35, delivered, for No. 2. The melt in this territory shows no improvement, and shipping orders on old contracts are still light. No sales of Southern Iron are reported. For prompt shipment we quote, delivered Cleveland, as follows:

Bessemer	$17.25
Northern Foundry, No. 1	$16.40 to 16.85
Northern Foundry, No. 2	15.90 to 16.35
Northern Foundry, No. 3	15.40 to 15.85
Southern Foundry, No. 2	15.85 to 16.35
Gray Forge	14.90 to 15.40

Coke.—The market continues quiet, the only sales during the week being small lots for spot shipment. Some low prices are reported. We quote Connellsville Furnace Coke for spot shipment at $1.50 to $1.60, at oven. A local furnace bought a small tonnage at the former price. We quote Connellsville 72-hr. Foundry Coke at $2 to $2.25, at oven, for spot shipment.

Finished Iron and Steel.—Although a few of the mills report a little improvement in small orders and specifications, the situation remains practically unchanged and the demand is still quite light. The Union and Empire rolling mills, Cleveland, started up this week after a shutdown of two weeks, having accumulated enough orders to keep them running this week and possibly next. Although some Iron Bars are being sold on the basis of 1.40c., Pittsburgh, the majority of the mills are firmly maintaining the base price of 1.50c., Pittsburgh. Steel Bars are firm at 1.60c., Pittsburgh. Specifications are expected in a few days from the Lake Shore Railroad for 10,000 kegs of Spikes on an order given last year which was not completed. Prices on the narrower sizes of Plates are being cut $2 a ton and price concessions of $1 to $2 a ton are being made on Sheets by some of the smaller mills. The demand for Sheets and Plates shows no improvement. The American Shipbuilding Company has nearly all boats under contract for 1908 delivery practically completed, and specifications from that company are about cleaned up for the season. The demand for Structural Material is light. The building outlook in this territory is unsatisfactory and few buildings will be erected this season that will requre much Steel in their construction. The general contract for two bank buildings to be erected in Youngstown has been awarded to the Thompson-Starrett Company, New York, and the order for the Structural Material will be placed in that city. About 600 tons will be required. Warehouse business is still light, but jobbers' stock sales in April will show up slightly better than in March. Warehouse prices are unchanged. We quote Iron Bars at 1.50c. to 1.60c., Cleveland, for car lots; Steel Bars, 1.70c., Cleveland, for car lots, half extras; Beams and Channels, 1.80c., base, Cleveland, and Plates, ¼-in. and heavier, 1.80c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Steel and Iron Bars at 1.70c. to 1.80c. Beams and Channels out of stock are 2.10c. to 2.15c., base. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2¾ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market continues stagnant, there being no demand for any kind of Scrap outside of an occasional sale of a car lot. As a result of the starting up of the local rolling mills this week some demand is looked for from this source, but the buying is expected to be only in limited amounts for immediate needs. Local foundries are buying no Cast Scrap, and the demand from outside melters is very light. Prices seem to remain about stationary, but in the absence of definite sales on which to base prices all quotations are mainly nominal. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	$11.00 to $11.50
Old Iron Rails	15.00 to 16.00
Steel Car Axles	17.00 to 18.00
Old Car Wheels	13.00 to 13.50
Relaying Rails, 50 lb and over	21.00 to 22.00
Heavy Melting Steel	11.00 to 11.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 12.00
Light Bundled Sheet Scrap	7.50 to 8.50

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	$16.00 to $16.50
Cast Borings	5.00 to 5.50
Iron and Steel Turnings and Drillings	6.00 to 7.00
Steel Axle Turnings	7.50 to 8.00
No. 1 Busheling	10.50 to 11.00
No. 1 Railroad Wrought	12.00 to 12.50
No. 1 Cast	12.00 to 12.50
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Cincinnati.

CINCINNATI, OHIO, April 29, 1908.—(*By Telegraph.*)

To the close observer of the markets it is apparent that the first month of the second quarter closes a little better in inquiry and sales, but considerably weaker in price, than it opened. The gulf that divides the halves of the year is none the less difficult to bridge, however, and if anything there is less conjecture on the part of the consuming interests, which seem to be resting on a confidence born of a feeling that prices on everything will go off considerably during that period. On finished material there is less disturbance in this market probably than in any other part of the country. In Pig Iron the Southern producers undoubtedly hold the key to the situation. The hand to mouth policy still prevails with buyers, and such inquiries as are coming out are confidently classed as feelers, and actual transactions are scarce. There is no difficulty experienced in obtaining money. The worst feature of the prevailing lassitude amohg tool manufacturers is the almost total absence of interest among buyers, there being no trouble in labor ranks nor price cutting evils to contend with as far as can be ascertained.

Pig Iron.—A majority of the dealers acquiesce in the opinion that the melt is increasing slightly. Iron is being moved a little more freely on contract, but reports indicate that some exceptionally low prices have been made by producers in the valley districts during the past week. A sale of about 1000 tons of Basic to a southern Ohio Steel maker is accredited to a valley interest at something like $16.50, delivered. Another sale of 100 tons each of Nos. 1, 2 and 3 Foundry to a prominent Pittsburgh interest at $14.70, Valley furnace, is reported. While several of the larger Birmingham furnace interests are holding for $12 and even $12.50 on No. 2 Foundry, it is conceded that $11.75 is being done and even $11.50 is reported. It is difficult to secure a price on the lower grades for the reason that there is a scarcity of Forge and Mottled on Southern yards, while the demand is practically nil. There is plenty of talk of $10 Iron for the second half, but sellers speaking with apparent authority say that practically all of the Southern furnaces still in blast will be blown out on the approach to such a price. There seems to be some interest in High Silicons, with the Southern product most in evidence on a basis of about $18 at furnace for 8 per cent. Jackson County Silveries are still quotable at $18.50 for 8 per cent. A northern Ohio melter is asking for a price on 900 tons of Malleable covering six months' delivery, but this is generally regarded as a feeler. A central Ohio consumer wants 100 tons of No. 4 Foundry for prompt shipment, and a Detroit melter is figuring on 300 or 400 tons of Foundry Iron for early delivery. A 30 days' option on 500 to 1000 tons of analysis Iron asked by a Chicago melter is not expected to develop a price, as furnaces generally evince a determination to avoid this class of business. For immediate delivery and balance of the second quarter we quote f.o.b. Cincinnati, freight rates being $3.25 from the Birmingham and $1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	$15.50 to $16.00
Southern Coke, No. 2	15.00 to 15.50
Southern Coke, No. 3	14.50 to 15.00
Southern Coke, No. 4	14.00 to 14.50
Southern Coke, No. 1 Soft	15.50 to 16.00
Southern Coke, No. 2 Soft	15.00 to 15.50
Southern Coke, Gray Forge	13.50 to 14.00
Southern Coke, Mottled	13.00 to 13.50
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.70 to 17.20
Lake Superior Coke, No. 2	16.20 to 16.70
Lake Superior Coke, No. 3	15.70 to 16.20
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	22.00 to 22.50

(By Mail.)

Coke.—From reports received in this market the opinion is offered that only 35 to 40 per cent. of the ovens in the Coke fields producing the bulk of the supply for the entire country are in blast; but that these figures do not represent the output, which is still less, comparatively speaking. If there is any Furnace Coke in demand or selling it is not in evidence in this market. From $1.70 to $1.85, at oven, is given as the price on Connellsville Furnace grades, as near as it can be estimated on a listless market. Choice Foundry grades range from $2.10 to $2.40, at oven, for favorite brands, except New River, which is quotable at $2.75 to $3.

Finished Iron and Steel.—Dealers are feeling a little better, as inquiries on some lines are improving materially. In this class are specifications on Structural Shapes, which come principally from the South. The assurances of the Carnegie Steel Company guaranteeing prices on Steel Bars to the close of the year have apparently had a stimulating effect on that commodity. Iron Bars are unsettled, but as all the interests in this section have been lined up successfully, it is felt that the situation will improve steadily. There is a good demand here for Boiler Tubes, and mill prices are as follows: 1¾ to 2¼ in., 57.50, with 5 off; 2½ in., 59.50, with 5 off; 2¾ to 3 in., 63.50, with 5 off. Prices are carload lots and f.o.b. Cincinnati. For stock shipment the 1¾ in. is quoted at 54, the 2½ in. at 56 and the 2¾ in. at 63. Dealers are confidently expecting a good movement on Boiler Plates within 30 days. Orders from stock on other lines are filled by local dealers at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—The Scrap market is, if possible, still weaker, with dealers beginning to show a disposition to push sales at slight recessions. The mills are still disinclined to buy, and all dealers are heavily stocked. The feeling, however, is that when the revival does come they will be well recompensed for holding their purchases. Prices, as nearly as they can be gauged from the existing situation, are as follows and are f.o.b. Cincinnati:

No. 1 Railroad Wrought, net ton	$10.50 to $11.50
Cast Borings, net ton	4.00 to 5.00
Heavy Melting Steel Scrap	11.00 to 11.50
Steel Turnings, net ton	5.00 to 6.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast and Wrought, net ton	8.00 to 9.00
Old Iron Axles, net ton	14.50 to 15.50
Old Iron Rails, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	11.00 to 12.00
Old Steel Rails, short, gross ton	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton	21.00 to 22.00
Old Car Wheels, gross ton	12.00 to 13.00
Low Phosphorus Scrap, gross ton	13.00 to 14.00

New York.

NEW YORK, April 29, 1908.

Pig Iron.—There has been little demand, and outside of one sale of about 2000 tons to a Pipe interest, there have been no transactions of any importance. The majority of the leading furnace companies are adhering to the prices established some time since, but there is enough outside Iron offering at considerably lower prices to take care of the current demand. Another meeting is to be held on the 7th of May of the Pig Iron and Iron Ore committees. We quote, at tidewater, as follows: No. 1 Northern Foundry, $17.75 to $18.50; No. 2 Northern Foundry, $17.25 to $18.25; No. 2 Plain, $16.75 to $17.25. Alabama Irons are $17 to $17.50 for No. 1 Foundry, and $16 to $16.50 for No. 2 Foundry.

Steel Rails.—One mill reports scattering orders, amounting to 3000 tons for the week. No new large business is under consideration, apparently, though it is understood that the New York Central has still some business to place for 1908.

Structural Material.—The manufacturers of Structural Steel find signs of betterment in the amount of new work on which estimates are being asked. It is believed that as the money situation and the matter of confidence have had more to do with the cutting down of construction than has the price of Steel, the fact that more money is now being invested than at any time since the October panic will have a favorable effect upon the Structural market. In New York City two important contracts that have been pending for some time are likely to be closed at an early day, and new school house work, long delayed, will be taken up in the next few months, through the passing of the necessary bond legislation last week. Considerable Steel will be needed for these buildings. In bridge work the week has brought out some business in the East, the American Bridge Company taking the Lehigh Valley viaduct over the Central of New Jersey—600 tons—and a 600-ton addition to the B. & O. contract for the Havre de Grace, Md., bridge. The Lake Erie & Western has placed 200 tons with the same company. In the West the principal bridge work pending is in additional amounts for the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul. At Princeton, N. J., 600 tons of Steel will be required for a new geological and biological laboratory. For the month of April, which has seemed one of meager business in comparison with the 100,000-ton months of a year ago, it is expected that the principal fabricating company will book about 20,000 tons, while it will probably be found that outside interests have booked as much. On mill shipments, delivery at tidewater, our quotations are as follows: Beams, Channels, Angles, and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

Bars.—Jobbers and brokers continue to supply buyers of Bar Iron at 1.50c., New York, or even lower, so that mills are taking but little business at the nominal standard price of 1.50c., Pittsburgh, or 1.66c., New York. The consumption is still light, and the mills that are active are only running at part capacity. Some quite important mills in this territory have not turned a wheel for a month or more. Steel Bars are held at 1.60c., Pittsburgh, or 1.76c., tidewater.

Plates.—Although local sales agents are receiving a rather larger number of inquiries than last month, buyers are slow to close and sales are far apart. Prices are firmly held as follows on standard sizes of Plates, at tidewater: Sheared Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of New York will this week advertise for about 4000 tons of Water Pipe for Manhattan and Brooklyn. The municipality is buying much less this year than usual. Current transactions appear to be confined to small quantities, it being only occasionally that a lot is purchased as large as 200 or 300 tons. On quantities of even this moderate size competition is keen and prices are made close to foundry costs. Carload lots of 6-in. can be had at $23.50 to $24 per net ton, at tidewater.

Old Material.—The local market is in about the same condition that has characterized it for the past 30 days.

Some grades are perhaps a trifle lower, while others are slightly firmer. About all the business now being done is in lots of one or two carloads. Steel Scrap at low figures is possibly in better demand than other classes of Old Material. The Steel works are ordering shipments on contracts rather more freely than some time ago. Heavy Cast Scrap and Stove Plate are exceedingly dull, and will perhaps remain so as long as Pig Iron can be had at such reasonable prices. No. 1 City Wrought is quiet, but the accumulations in local yards are light. The rolling mills are practically out of the market, as they are either idle or are purchasing stock directly from railroad companies. It is observed that speculative interest in Old Car Wheels is manifesting itself, as this class of material is considered cheap at present prices. As the Car Wheel foundries are doing little or nothing, the railroad companies are obliged to part with their Old Wheels at the best offers received from speculative buyers. Cast Borings and Wrought Turnings are in somewhat better demand, and can be sold at a trifle more than the prices prevailing two weeks ago. These grades of Scrap are in lighter supply than usual, as a result of the inactive condition of machine shops and factories. Quotations are about as follows per gross ton, New York City:

Old Girder and T Rails for melting	$9.50 to $10.50
Heavy Melting Steel Scrap	9.50 to 10.50
Old Steel Rails, rerolling lengths	10.50 to 11.50
Relaying Rails	19.00 to 20.00
Old Iron Rails	14.00 to 15.00
Standard Hammered Iron Car Axles	16.00 to 17.00
Old Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.50
Iron Track Scrap	9.50 to 10.50
No. 1 Yard Wrought, long	10.50 to 11.50
No. 1 Yard Wrought, short	9.50 to 10.50
Light Iron	5.00 to 6.00
Cast Borings	4.50 to 5.50
Wrought Turnings	6.00 to 7.00
Wrought Pipe	9.00 to 10.00
Old Car Wheels	14.00 to 15.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.00 to 10.00
Locomotive Grate Bars	9.50 to 10.50
Malleable Cast	10.00 to 11.00

Owing to the growth of its scrap iron and steel business, the Morton B. Smith Company, 243 Front street, New York, has found its present offices too small for this department, and has rented offices in the Market & Fulton National Bank Building, 81-83 Fulton street, where this branch of the business will be carried on after May 1. The metal business will remain in its present location with offices and warehouse at 243 Front street.

The Warren Foundry & Machine Company has removed its New York offices from 170 Broadway to the Trinity Building, 111 Broadway.

Metal Market.

NEW YORK, April 29, 1908.

Pig Tin.—The market was very dull until Tuesday when business picked up, and about 300 tons were sold on that day alone. To-day prices have advanced ⅜c. Rumor has it that the American Sheet & Tin Plate Company is buying. It would certainly seem as if the Tin Plate manufacturers were in need of metal, as that business is very active. Price changes during the week moved toward lower levels, until to-day, as follows:

	Cents.
April 22	31.70 to 31.75
April 23	31.90
April 24	31.85
April 27	31.75
April 28	31.40 to 31.50
April 29	32.25

It is difficult to measure the statistical position as estimates of deliveries into consumption in April run all the way from 3000 to 3400 tons. Taking into consideration the good volume of business yesterday, however, it would not be surprising if they were between 3300 and 3400 tons. The arrivals so far this month are 3280 tons and the afloats 1881 tons. The London market closes firm and higher at £144 5s. for spot and £143 for futures.

Copper.—Some business has been done on a slightly lower basis, but prices do not recede without marked resistance. Sales were reported on Tuesday at 12.62½c., net cash for Electrolytic, and on the same day in another quarter 12.75c. was refused for delivery, 30 days. The general market, however, is 12.75c., net cash. Lake appears to be very firmly held at 13c., but there is little or no business doing. It looks as though there was an effort being made to sustain the Lake prices. Casting grades are quotable at 12.50c. to 12.62½c. The market has been under pressure now for about a month, and it has been hard to drive prices down to the old low figures in spite of the increased production which is bound to come from the Butte camp during the last half of the year. Consumption in this country has apparently not increased much, and there are many conflicting reports about the amount of metal held by consumers. The consensus of opinion is that they have not bought much on speculation, and have little metal on hand. Authorities vary as to consumption, but it is estimated that 30,000,000 lb. a month would cover the domestic melting. Six months have passed since the panic, and while industrial conditions are worse instead of better, financial conditions have improved materially, and there is no danger of loans on Copper metal being called now as was the case last year. Months ago it was pointed out that no permanent upward movement could be expected until after financial conditions changed to permit railroads obtaining funds on more satisfactory terms. Although the first corner has been turned, it does not necessarily follow that all will be able to so satisfactorily obtain the funds for improvements not as urgent now as a year ago. The exports of Copper may reach 30,000 tons this month, as 26,620 tons were reported up to April 28. The stocks of Copper which are held, and no one denies that the stocks are large, are not concentrated in any one country, considerable being in Continental Europe, a large amount in the United States and quite a little in Japan. It is inconceivable that the scattered holders, all of whom are now in a strong financial position, would attempt to sell at the same time. The London market is 12s. 6d. lower than last week at £57 7s. 6d. for spot and £58 for future. There is some Electrolytic in London at £59, but this is Japanese, and American Electrolytic is there quoted at £60.

Lead.—The American Smelting & Refining Company advanced prices 10 points April 28, making its price in New York 4.10c. This interest has been the cheapest seller for weeks, and ouside producers who had been quoting 4.05c. promptly advanced their price to 4.10c. The St. Louis market is very firm at 4c.

Spelter.—An advance of 5 to 10 points in the Spelter market is largely attributed to rumors that some large producers of common Western brands are seeking to test the foreign market. Since the formation of the Spelter Syndicate on the Continent prices in Europe have been fairly steady, and the present quotation for Spelter in London is £21, equivalent to about 4.62c. With Prime Western brands quoted at 4.57½c., St. Louis, there would have to be considerable concessions, but should the movement be accomplished it would work for higher prices in this country. Some conferences have been held in New York this week between producers and exporters with that view in mind. Domestic business is dull, and, as stated, Prime Western brands are quoted at 4.57½c., St. Louis, and 4.70c., New York.

Ferroalloys.—Prices of Ferromanganese are quoted higher, at $44 to $45, seaboard, but there has not been sufficient business to really test the market, and perhaps lower figures could be secured either for round lots or at a firm offer. A Buffalo steel company has inquiries in the market for 1200 tons, but this may be more to test the market than for actual requirements. Prices of 50 per cent. Ferrosilicon are again lower, and $75 has been done for stray lots. Importers, however, are asking $80.

Nickel.—Prices are without change, at 45c., for ton lots, and 50c. to 60c., for smaller quantities.

Antimony.—The unsatisfactory conditions continue, and prices are without change at 8.75c. to 9c., for Cookson's; 8.75c., for Hallett's, and 8.50c., for outside brands.

Tin Plate.—Business is maintained in good volume, and prices are firm. For 100-lb. IC Coke Plates, $3.89 is quoted, New York, and $3.70, Pittsburgh.

Old Metals.—The demand is light, and dealers' selling prices are lower, as follows:

	Cents.
Copper, Heavy and Crucible	12.00 to 12.25
Copper, Heavy and Wire	11.75 to 12.00
Copper, Light and Bottoms	11.25 to 11.50
Brass, Heavy	9.25 to 9.50
Brass, Light	7.25 to 7.50
Heavy Machine Composition	11.50 to 11.75
Clean Brass Turnings	8.25 to 8.50
Composition Turnings	9.00 to 9.50
Lead, Heavy	3.90
Lead, Tea	3.65
Zinc Scrap	3.50

Removals in the Metal Trade.

The American Smelting & Refining Company has moved to the City Investing Building, 165 Broadway.

Robert W. Conklin, sales agent of the Granby Mining & Smelting Company, has moved to Room 1412, City Investing Building, 165 Broadway.

W. A. Locke has moved to 99 John street.

Iron and Industrial Stocks.

NEW YORK, April 29, 1908.

A sharp upward turn in all security prices followed the announcement in the past week of the successful placing of several bond issues of which the principal one was that of the Pennsylvania Railroad Company for $40,000,000. This was accepted as an emphatic indication of returning confidence among investors, and hailed as a harbinger of better

times. The advance in a number of stocks was strikingly large. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follow: United States Steel common 34⅞ to 37, preferred 99¼ to 101¾; Car & Foundry common 33 to 34⅞, preferred 94½ to 96½; Locomotive common 45⅞ to 47½, preferred 97⅞ to 100; Steel Foundries common 6¾, preferred 32¾ to 34; Cambria Steel 29½ to 30½; Colorado Fuel 24 to 25¼; Crucible Steel common 5⅛ to 5⅜, preferred 37¼ to 39¼; Pressed Steel common 23½ to 30, preferred 80 to 86; Railway Spring common 33⅞ to 35; Republic common 16¾ to 18⅛, preferred 66¼ to 68¾; Sloss-Sheffield common 43⅛ to 46; Cast Iron Pipe common 24½ to 26, preferred 71½ to 72¾; Can common 5 to 5¼, preferred 50⅞ to 56. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 36⅜, preferred 101, bonds 97¼; Car & Foundry common 35½, preferred 96⅜; Locomotive common 47½, preferred 100; Colorado Fuel 24⅝; Pressed Steel common 30, preferred 85; Railway Spring common 37¼; Republic common 17⅜, preferred 67¾; Sloss-Sheffield common 45¼; Cast Iron Pipe common 25½, preferred 71¾; Can common 5, preferred 55.

Dividends.—The Warwick Iron & Steel Company has declared a semiannual dividend of 3 per cent., payable May 15.

The Western Electric Company has declared a quarterly dividend of 2 per cent., payable May 1.

The Pressed Steel Car Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable May 27.

The United States Steel Corporation has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 1, and ½ per cent. on the common stock, payable June 30.

The La Belle Iron Works, Steubenville, Ohio, has declared a quarterly dividend of 2 per cent., payable May 1.

The Sault Rail Mill Shuts Down.

TORONTO, April 25, 1908.—Since Saturday last the open hearth plant, the Bessemer plant and blooming mill of the Algoma Steel Company, Sault Ste. Marie, have been out of operation, and their closing down was shortly followed by that of the company's rail and finishing mill. The reason officially given for the suspension is the condition of the rail market. Though there is to be much railroad building in Canada this year, intending buyers have not been forward with their orders. A twelvemonth ago the situation was very different. At that time and for two years previous, railroad companies were glad to get rails at almost any price, certainty and promptness of delivery being then of more moment than lowness of price. Now, however, instead of a dearth there is apparently a surplus of rails. Railroad companies have advantageous offers from makers outside of Canada, and Canadian makers must give up some of the benefit of their protection to get the business. On American rails the duty is $7 a ton, and on British rails it is $4.66 2-3. It is believed that the placing of contracts for a large tonnage will not be long deferred, now that the season for the opening of navigation has arrived. The railroad builders in this country are not crippled by lack of funds. The Canadian Pacific Railway Company's cash resources are particularly ample, and its credit is high. The Grand Trunk Pacific has all the money it needs, its latest offering of bonds being readily underwritten in London. As the builder of the Eastern Division of the National Transcontinental Railway, the Dominion Government has the excellent credit of Canada to draw on.

That the Algoma Steel Company is confident that rail orders will be forthcoming may be inferred from the fact that its blast furnaces are continuing in operation. They will go on turning out pig iron for the steel plant. There is little danger of an excessive accumulation of pig iron, for the company's steel plant has a consumptive capacity beyond the limit of the blast furnaces' output. To keep the rail mill going steadily for any long period the company is obliged to supplement its own supply of pig iron by purchases. At the present time, when rail orders are being held back, the company does not consider it advisable to import pig iron and pay the duty thereon. To add thus to the cost of producing the rails before it can be known whether high or low prices await the rails, might not be prudent. At all events the company prefers to accumulate pig iron of its own make to accumulating rails made partly from imported pig iron.

On the main line of the National Transcontinental Railway construction is to be pushed this season, both in the East and in the West. The Government has placed under contract the long section between Winnipeg and the point at which the company's branch from Fort William is to be met. On that branch the steel is to be laid this summer. Other sections of the Eastern Division will be made ready for the rails this year. On the Western Division a large tonnage will be laid. Besides the main line, there are tributary lines to be built. The Railroad Committee of the Canadian House of Commons recently reported in favor of the granting of two years' extension of time to the Grand Trunk Pacific Branch Lines Company for the building of its feeders to the main road. Altogether these feeders are to have a trackage of 5000 miles. In the act incorporating the company, in 1903, it is provided that the work shall be under way in five years. The time is now practically up, and the company has asked two years more, which, being recommended by the Railroad Committee, will probably be granted. Representatives of the company stated to the committee that contracts are to be let this summer for five of the branch lines in the Northwest. C. A. C. J.

Hardening High Speed Steel.—At a recent meeting of the Liverpool Engineering Society, Liverpool, England, H. H. Hill read a paper on "High Speed Steel," in which he called attention to some of the most recent advances in its application. His remarks with regard to hardening were especially interesting. He said there were several points to be closely observed if uniformly good results were to be obtained, and the critical temperatures could only be caught with precision by the aid of a pyrometer. In large furnaces the thermo-electrical, the most simple of the electric pyrometers, had but a limited sphere of usefulness, as it could only indicate the temperature of the area where it happened to be fixed, a temperature which would probably bear no relation to the other areas of the same furnace. A simple form of sentinel pyrometer offered many advantages, and by suitably arranging the hearth with a number of maximum and minimum sentinels the whole series of varying hardening areas could be controlled in the same furnace at the same time; an advantage which could not be overestimated where large furnaces were used. For intermittent hardening they were also an ideal arrangement. A tool hardened on these absolute lines would do three times the work of one which had only been approximately correctly heated.

The old iron ore mines in the vicinity of Boyertown, Berks County, Pa., may be reopened for the supply of Schuylkill and Lehigh valley furnaces. These mines, which have been operated at intervals for over 150 years, yield a fair quality of ore, and extensive tests are said to indicate a greater area than hitherto imagined. Over 1000 acres of farm land have been put under option, the mineral rights being mentioned expressly.

The Standard Bridge Tool Company, 709-10 Curry Building, Pittsburgh, is building a Thomas No. 2 spacing table for the Dominion Bridge Company, Montreal, Canada, a similar machine for the Modern Steel Structural Company, Waukesha, Wis., and a large spacing table for the Chicago Bridge & Iron Works, Chicago, for use on large work.

With a view to constructing a hydro-electric power plant the Little Wolf Power Company, Oshkosh, Wis., has been incorporated with a capital of $250,000. The promoters expect in the near future to develop this project and transmit current to Oshkosh. Leander Choate is president; Casper Faust, vice-president; F. H. Josslyn, secretary; E. H. Steiger, treasurer.

The National Association of Brass Manufacturers will hold its semi-annual meeting in Toronto, Canada, on Tuesday and Wednesday, June 9 and 10, which is the week during which the American Foundrymen's Association and foundry supply interests will meet in that city.

The Goshen Iron Company announces that its offices have been removed from Wilmington, Del., to its blast furnace at Goshen, Va.

The Machinery Trade.

NEW YORK, April 29, 1908.

A hopeful view of the future is the most encouragement afforded the machinery trade in this district; the general conditions prevailing and the amount of business being transacted are such as to indicate no immediate improvement from the present dullness. In the past week no developments were reported that would stimulate trade, and some important interests say that nothing is in sight in the way of projects that will require the purchase of a considerable amount of machinery this spring, aside, of course, from Government work. Both dealers and manufacturers are doing but little business and the majority of them report a small volume of orders and inquiries, with the aggregate no larger than that of the previous weeks. The opinion is that no marked increase in business can be expected for some months. It is certain that the larger interests will have to come into the market before trade shall become more active. The railroads, which are such an important factor in the machine tool trade, are still adhering to the retrenchment policy. Among the roads which are being followed closely is the Pennsylvania Railroad, which will require a great deal of mechanical equipment for its New York improvements. It is hoped that part of the proceeds from the new $40,000,000 bond issue will be used for the work.

There has been quite a demand for equipment for canning factories in this market of late, and some houses that make special machinery in that line have done a fair month's business. The power men, of course, have been getting some business from that source too. Much of the purchasing has been done for plants on the Western coast, and the machinery has principally been sent to fruit canning establishments.

Although the Panama Canal Commission has about completed its large purchases of machine tools and similar shop equipment, it is expected that it will not be long before some large buying will again be done, although purchasing will be for a different line of equipment. Judging from specifications which are now being prepared, according to machinery men who are watching the future closely, bids will soon be asked for on a large amount of cement making and construction equipment. This will, of course, include some power apparatus, conveying machinery and like equipment, and as the concrete work to be done in the canal zone will be extensive the buying will necessarily be large. The machine tool buying in the future will be confined to repair orders and orders for emergency equipment for shop additions, &c., and it is not probable that there will be any very large lists issued, as most of the machine shops now installed on the Isthmus are considered inadequate to take care of the future work.

Delaware Lackawanna & Western Railroad Machinery List.

The machine tool list issued by the Delaware, Lackawanna & Western Railroad, to which we referred in these columns two weeks ago, is probably the most important inquiry now before the trade and is being figured on by the important houses. The machines on this list are intended for the new shops nearing completion at Scranton, Pa., and include one 6000, one 1600, one 800, one 450 and one 1500 lb. steam hammer, three upright shears for cutting bolts ⅛ to ¾ in., 1 to 1¼, and 1 to 1¾ in., respectively; three bolt headers, one each for bolts of ½, 1 and 1½ in. diameter; one bolt cutting and threading machine for ½ to 1½ in. bolts, one bolt cutting and threading machine for ⅜ to 1½ in. bolts, one double spindle bolt pointer for bolts ¼ to 1¼ in. diameter, one motor driven alligator shear, to shear bar iron 4 x 4 in. and round iron 4 in. diameter; one heavy punch and shear, 15-in. throat, to punch 1¼-in. plate and shear 3-in. round bar; one cold saw cutting-off machine, one single end locomotive axle lathe for turning axles up to 10 in. diameter, one 5-ft. radial drill, one vertical drop forge trimmer, to be used in connection with 1500-lb. drop hammer; one 50,000-lb. spring testing machine, one combination taper machine and rolls, one spring punch and shear, one hydraulic banding press, one grinder for bolt headers, one die grinder, four 3, one 1 and four 4 ton jib cranes, with spans ranging from 12 to 23 ft.; one electric hoist and track and three blowers for forges. These machines, with the exception of the steam hammers and the bolt cutting and pointing machines, are to be operated by independent motors, the bolt cutting and pointing machines to be operated in group by motor. Quite a little additional equipment will be purchased for these shops, including the furnaces, the specifications for which have not been entirely completed because the kind of fuel to be used has not yet been decided upon. It is expected that this matter will be settled shortly and the specifications sent out within the next few weeks. It will be remembered that the large machine shop and some other buildings for this group will not be constructed for a year or more, and when these are taken up the principal machine tool equipment will be purchased.

Because of the growth of business in Canada and the extension of present railroad systems and building of new roads, a number of new enterprises are being brought forward to manufacture rolling stock and supplies used by railroads. Of the several projects under consideration one that is likely to materialize shortly is that of the Imperial Locomotive Works of Montreal, which is understood to have purchased 100 acres of land opposite Lachine Station, Que., as a site for a new locomotive plant. It is understood that work of construction is to be started this spring and that Colonel Edye, commissioner in Montreal of the Trust & Loan Company of Canada, is interested.

The Canadian Crocker-Wheeler Company, Ltd., has been organized for the manufacture and sale in Canada of the well-known Crocker-Wheeler electrical apparatus and has opened offices in the Street Railway Chambers, Place d'Armes Hill, Montreal, Que. The dimensions of the buildings to be erected and the machinery to be installed have not yet been decided upon. F. E. Lovell, president of the new company, is a member of the old established lumbering firm of H. Lovell & Sons, Coaticocke, Que., which has extensive interests in mill and timber lands throughout the Province of Quebec. Russell Stinson and F. J. Bell, vice-president and secretary-treasurer, respectively, have been identified with the manufacturing, construction and sale of electrical apparatus in Canada for the past 15 years and are particularly well known in Montreal. The Crocker-Wheeler Company, Ampere, N. J., manufactures all types of direct current and alternating current motors and generators, and has developed a special line of motors for machine tool and printing press drive and steel mill work. Crocker-Wheeler alternating current generators up to 2000 kw. capacity have been in successful operation in Canada for some years.

The Eagle Pencil Company, New York, has some inquiries out for equipment for a large pencil plant, to be erected near London, England. The plant will include equipment for manufacturing metal accessories for pencils and also machinery for working lead.

The Garrett Color Company, 114-116 West Twenty-seventh street, New York, has been purchasing machinery of late for a color plant which is being installed at that address. The company has also been buying equipment for manufacturing collapsible tubes, both for its own use and for the trade. W. H. Walker is president; E. H. Garrett, vice-president, and D. D. Dana, secretary.

The Sewerage and Water Board of New Orleans, La., will receive bids until June 30 for the following machinery for the Algiers sewerage station C: Two 100-kw. 250-volt direct current generators, two 75-hp. 250-volt motors, one 2,500,000-gal. turbine pump to work against a 125-ft head, direct connected to an electric motor; one 1,000,000-gal. triplex pump to work against a 125-ft. head, geared to an electric motor; one 2,000,000-gal. centrifugal pump unit to work against a 20-ft. head, two 4,000,000-gal. centrifugal pump units to work against a 20-ft. head, two 5-hp. 250-volt motors, one surface condenser, capable of condensing 6500 lb. of steam per hour, together with air pump and other appurtenances.

Inquiries are in the market for about $14,000 worth of power equipment for a lighting plant for the Borough of High Bridge, N. J. The equipment will include about 80 hp. of engines, electrical equipment and boilers to match.

Proposals will be received by the Board of Water Supply, city of New York, at its office, 299 Broadway, on May 12, for the construction of the Wallkill pressure tunnel, which is a section of the Catskill aqueduct. This work will entail the construction of a pumping plant and will include considerable rock drilling. Air compressors, tank grouting machines, concrete machinery and general contracting machinery will be required on the work, so it is probable that the successful bidder will be a large purchaser of machinery.

Charles A. Schieren, Jr., of the Charles A. Schieren Company, leather belting manufacturer, returned last week from Europe, where he spent a month in looking over the business situation in England and Germany. Although business is fairly steady there, Mr. Schieren says the demand for equipment is not what it was a year ago. There is nothing alarming in the business outlook, however, and there seems to be no reason why the trade should not pick up as an optimistic feeling prevails in those countries among manufacturers in general. Mr. Schieren makes a business trip through the countries mentioned above every year and is in close touch with the situation.

The Lees-Williams Company, 806 House Building, Pittsburgh, has recently secured agencies as follows: John Davis Company, Chicago, steam traps, &c.; Gardner Governor Company, Quincy, Ill., high and low pressure and general service pumps; Trill Indicator Company, Corry, Pa., Triumph steam and gas engine indicators. The Lees-Williams Company is also the exclusive distributing agent for Shelby seamless cold drawn tubes, made by the National Tube Company, Pittsburgh, and carries a large and complete stock of these tubes in the Terminal Warehouse, S. S., Pittsburgh,

enabling it to fill orders promptly for any sizes and quantities.

Catalogues Wanted.—The George H. Tay Company, Nineteenth and Minnesota streets, San Francisco, will be pleased to receive catalogues and quotations from manufacturers of engineering and heating supplies and specialties.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 28, 1908.

New business comes out slowly, and the volume taken during the past week will not aggregate any greater total than that transacted during the previous one. The demand is still confined to single tool propositions, and no specifications covering any extended equipment are before the trade. A hopeful attitude prevails, however, and many of those in the trade believe that more active conditions will develop before a great while. At the time, however, purchasers will not take on any further equipment than is absolutely needed for their specific purposes, as conservative policies are still largely being enforced and purchases are cautiously made. More shopping around for requirements is to be noted, and inquiries are frequently made to a considerable extent, even though the tools required be small. The railroad interests show no indication of coming into the market, although the $40,000,000 bond issue of the Pennsylvania Railroad is taken as an encouraging sign, and while nothing beyond the completion of its New York terminals and further work on some improvements and extensions, which were held up last fall, is announced by the company, it is believed that the action taken by this road will have an awakening tendency on the part of other railroads and industrial concerns, which held up operations so extensively last fall.

Manufacturers continue to book a small volume of business, and are able for the most part to keep plants operating on the same restricted basis at which they have been running for some months. In a few instances some improvement is to be noted, but the increase is irregular and frequently what is gained in one week is lost in another.

There is a fair demand for second-hand tools, both standard and special. The larger proportion of inquiry is for those of the medium and smaller sizes. Sales of equipment of several plants which have become financially embarrassed recently have developed some rather good buying, particularly from individual buyers who, it is reported, have paid prices for tools beyond that which would have been paid by dealers, and, in instances where tools have been little used, not much below what new tools could have been purchased for. Boilers and engines are not active. Prospective business in the way of large equipment is still held up, although in some of the smaller power equipment more business has been done.

The foundry trade still shows a dull tendency. Users of castings continue to place their requirements in a hand to mouth fashion, and both steel and gray iron foundries are running on a much restricted basis. Contract work is scarce, and most of the business is of a day to day character. Prices are not strong and some pretty low figures have been named by some foundries in order to get enough work to keep them going.

The Wm. Steele & Sons Company has been awarded a contract for two large coal pockets, storage sheds, offices and stables for the Philadelphia & Reading Railroad, extending from Berks street to Norris and from Ninth street to the railroad tracks, embracing an area of 200 x 400 ft. The work includes the erection of two trestles, running the entire length of the yard. The estimated cost was about $240,000.

The State Board of Health has approved plans for a water works and filter plant having a daily capacity of 2,000,000 gal., to be erected by the Paxtang Consolidated Water Company on the Swatara Creek at Hummelstown, Pa.

Ballegern & Perrot, engineers, have completed plans for an additional three-story and basement manufacturing building for J. D. Lit at 233 South Fifth street. The new building will be 28 x 112 ft., and is to be of slow burning construction. Tower fire escapes, freight elevators and other modern factory installations are to be provided.

Wilson, Harris & Richards, engineers, are receiving estimates for a valve house, 71 x 80 ft., and foundations for a 3,000,000 cu. ft. gas holder, to be built at Atlantic and Venango streets, in this city, for the United Gas Improvement Company.

The liveliest kind of bidding was brought out the past week for bridge and sewer work, to be done for the city of Philadelphia, the aggregate cost of which will involve the expenditure of nearly a million dollars. For the five bridges to be built there were an average of 15 bidders on each bridge. The bridge work involves an expenditure of $400,000. The following awards for a portion of this work have been announced by the director: Bridge on the line of Sedgewick avenue over the Reading Railway, $26,561; bridge on the line of Ontario street, under the Richmond branch of the Reading, $33,714; bridge over Hunting Park, on the Philadelphia & Newtown branch of the Reading, $37,545, all to Thomas F. Reilly. Bridge on Rockland street over North Penn Railroad, to McGraw & Gray, $23,400. Bridge on Twenty-ninth street over the Pennsylvania Railroad, to Filbert Paving & Construction Company, $32,159.

Dodge & Day, engineers, report business rather quiet. Plans have been completed by them for a considerable amount of work, but a good share has been temporarily held up, pending a return of more active business conditions. One of the recent propositions for which they are now engaged on plans and specifications is for a large manufacturing plant for the Lee Hat Mfg. Company, Danbury, Conn., details regarding which are not yet completed. The cost of the plant and equipment will be about $150,000.

Deinelt & Eisenhardt, Inc., report a slight increase in the demand for dead stroke hammers, orders having been recently taken for four of different sizes, one 100-lb. hammer being for the Parkersburg Iron Company, Parkersburg, Pa. The demand for hydraulic jacks is light, the railroads, which are usually large buyers, being out of the market. A number of old contracts for special tools are still on the books, but not enough business has developed to enable the various departments of the plant to be run on full time.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 28, 1908.

Business in the local machinery market has improved slightly during the past week. Builders of machine tools report a little improvement in orders and a considerably better volume of inquiries. Some improvement is also noted in export orders. With two or three exceptions no inquiries are being received as yet from railroads, and tool builders are looking to other sources for a market for their products. With the limited domestic demand more attention is being paid than usual to the foreign trade. There are more inquiries for heavy machinery and the placing of some good orders for coal and handling machinery is expected soon. A local machine tool builder who has visited a number of Canadian points during the past few days reports that he found the Canadian situation looking a great deal better, and he expects that the volume of orders from that country will soon reach normal.

With the local machine tool dealers the market remains about stationary, although the little change that has been noticed during the past week has been for the better. The sales are nearly all single tools in small sizes. The buyers in most cases are men who are starting up small machine shops. Very little buying is being done by large manufacturing plants and there are but few inquiries from new concerns for machinery equipment for new plants. A number of new projects have been launched to engage in manufacturing in the metal trade lines in this territory during the past few months, and it is expected that some of these will be carried out and create a demand for machinery and tools as soon as industrial conditions show sufficient improvement. The offerings of second-hand tools are still large, a large share of these tools being in first-class condition, but they are moving slowly, the prices that are asked in most cases being more than dealers are willing to pay. The demand for second-hand tools is light.

Makers of street railway equipment report a very fair volume of orders. Street railways have not been affected much by the depression, and their purchases to keep up their equipment have not been curtailed to any extent. Manufacturers of hardware products used largely by the farmers report a good demand for their goods but the orders are mostly for small lots for the reason that the jobbers are unwilling to carry large stocks.

The foundry situation shows no improvement. The demand for castings is very irregular. For a few days the jobbing plants will have a fair run of orders and then the demand will almost disappear for a while. Practically all orders for castings are for small lots for immediate delivery. Consumers are unwilling to contract ahead. The local jobbing foundries are running at from one-third to one-half of their capacity.

Foote, Burt & Co., makers of single and multiple spindle drills and bolt cutters, report that the machine tool outlook has improved considerably with them during the past two weeks. They have taken some good foreign orders, and have received some very good domestic inquiries.

The Merwin Mfg. Company, Cleveland, recently incorporated with a capital stock of $10,000, has started a plant on Merwin street for the manufacture of eave trough, conductor pipe, &c. It is the intention of the company to eventually erect a new plant. R. E. Curtis is president, and W. E. Lutton, secretary.

The Gordon Propellor Company, Cleveland, has been in-

corporated with a capital stock of $100,000, by F. O. Gordon, John Huber, C. R. Vernon, J. O. Schmitt, and William H. Runnels. The company will make propellors for small boats. A plant is being fitted up on West Third street.

At a meeting of the Ravenna Furnace & Heating Company, Ravenna, Ohio, held a few days ago, Albert Dietrich was elected secretary, treasurer and general manager in place of W. A. Hammond, who will retire from the company on May 1. F. C. Park remains as president.

The McCaskey Register Company, Alliance, Ohio, has been taken over by a new company, of which A. G. Ryley, an officer and large stockholder in the Carnahan Stamping & Enameling Company, Canton, has been elected president. Several other Canton men are also prominently interested in the new company, which is capitalized at $400,000. The other officers are S. S. Kurtz, vice-president and general manager; S. G. Zimmerman, secretary and treasurer, T. Uran, assistant secretary and treasurer.

The Summit Foundry Company, Akron, Ohio, recently incorporated, will not build a new plant, but has leased a foundry on Kelley avenue and Railroad, East Akron. The company will do a general jobbing business.

The Jewett Stamping & Enameling Company, Jewett, Ohio, has been incorporated with a capital stock of $25,000 by Fred Spriggs, J. C. Landkrohn, H. W. Hermann, G. W. Dankworth, and C. H. Dankworth.

The city council of Lima, Ohio, has refused to renew a lighting contract with a commercial company, and has taken action toward the issuance of $80,000 in bonds for building a municipal lighting plant.

A plant for furnishing heat, light and power will be erected in Mogadore, Ohio, by the Mogadore Electric Light & Power Company, which has just been granted a franchise by the council of that village.

The Brown-Cochran Company, Lorain, Ohio, manufacturer of Brown gas engines, marine motors, refrigerating machinery, &c., has reorganized its sales and engineering departments and made other necessary changes to take care of its expanding business. William H. Maxwell, formerly manager at Des Moines, Ia., where he succeeded J. C. Compton, has been appointed general sales manager. J. O. Brown, president of the company, who has heretofore had charge of the sales department, will in the future devote himself exclusively to the executive affairs. The same staff of assistants will be retained in the sales department. C. I. Longenecker has been appointed chief engineer and he, with Mr. Brown, are collaborating in the production of a gasoline traction engine and gasoline hoist, both of which will be placed on the market in the near future. It is the intention to establish additional branch houses and materially increase the company's business in foreign markets. The company is experiencing a good demand for its ice and refrigerating machinery, and has twelve plants in process of erection, including marine installations. A satisfactory demand for marine engines is also reported, and the officials of the company state that the demand for Brown power engines has been uniformly good, and is increasing in many sections of the West.

The Independent Tack Company, Kent, Ohio, will double the capacity of its plant with the intention of manufacturing a more complete line of staples and tacks, and with the increased capacity will be in a position to take care of its business more satisfactorily than it has been able to do in the past.

New England Machinery Market.

WORCESTER, MASS., April 28, 1908.

Business goes on in the machinery trade with little change for better or worse. The dealers continue to sell some tools, the larger part of the orders being for used machinery. The machine tool builders of New England are certainly no busier, with a few exceptions. In Worcester the larger shops are laying off more men, having accumulated sufficient stock for the present. Similar reports are received from other centers of the industry. At Fitchburg the Putnam Machine Company is busy, but few others of the machinery people are running full time and with full force.

Outside of the machine tool industry the indications are brighter. Scattered about this territory are quite a number of manufacturers who are running full with unreduced forces. A few examples are the Warren Steam Pump Company, Warren, Mass.; Blanchard Machine Company, Cambridge, Mass., which does contract work; Meisel Press Company, Boston, manufacturer of printing presses; Gillette Safety Razor Company, Boston; Critchley Machine Tool Company, Worcester; John L. Parker Company, Worcester, manufacturer of pressed metal goods; Worcester Pressed Steel Company, Worcester; New Departure Mfg. Company, Bristol, Conn., and Morgan Construction Company, Worcester. These do not by any means complete the list. Their names were gathered at random without special search. Many works have a good deal to do in supplying customers with repair parts, this constituting a part of the general task of overhauling and rearranging machinery, as the opportunity is taken to prepare for a resumption of business on a large scale. Most works will be in much better shape to take advantage of a good market for their products than they were during the recent period of great demand.

The Crompton & Knowles Loom Works, Worcester, Mass., manufacturer of textile machinery, has awarded the contracts for large additions to the works, to total in cost $155,000. There will be an administration building and factory combined, a large machine shop and a foundry. The factory building will be 60 x 246 ft., five stories. One end will be extended to give a frontage of 60 ft. to that part of the building where the offices will be located. The machine shop will be between the present shops for the same purpose and will be 54 x 184 ft., four stories. The foundry, which will in part replace old buildings, will be 225 x 225 ft., one and two stories, the upper floors to be devoted to supply rooms. The company states that it will be in the market later for a large amount of new machinery and other equipment for the new buildings, which will greatly increase the producing capacity of the great shops. The new plans are the direct outcome of the permission, long withheld, to bridge a public street to connect present buildings with the proposed factory and office building. Upon this depended the location of the new works in Worcester. Had an adverse decision been reached by the Massachusetts Legislature the new buildings would have been located at Providence, R. I., where the company has a branch factory.

George B. Allen, engineer, Providence, R. I., is preparing plans for a new factory plant for clients the name of which he is not yet at liberty to divulge. The plans call for a brick building, 60 x 250 ft., with ell 40 x 60 ft., and three stories throughout.

Richards & Co., North Attleboro, Mass., have started work on enlargements and alterations of their factory in that place, J. E. Judson, 155 Main street, Pawtucket, R. I., being the engineer in charge of the work. The plans call for a new building 40 x 250 ft., one story. The building will be rented to manufacturing jewelers.

The C. G. Garrigus Machine Company, Inc., Bristol, Conn., recently organized to manufacture special machinery, blanking, piercing, stamping, forming, cutting and drawing tools, has elected Clarence G. Garrigus, president and treasurer; A. F. Rockwell, vice-president; W. L. Barrett, secretary, all of Bristol, and L. G. Judd, New Britain, assistant secretary. The site for the new shop has been purchased and the intention is to build some time during the summer. The company has begun to manufacture in W. L. Barrett's shop.

The Middletown Electric Light Company, Middletown, Conn., has purchased a tract of land in that place, and plans to erect a modern plant, with improved generating equipment.

The Waterbury Clock Company, Waterbury, Conn., has awarded the contract for a new factory building, to be 40 x 176 ft., five stories.

The Warren Steam Pump Company, Warren, Mass., manufacturer of steam pumps, has gone on a full time schedule with full force of men, owing to recently received orders.

The Rathbun-Jones Engineering Company, Toledo, Ohio, builder of producer gas engines, has established a Boston office at 79 Milk street. Alexander W. Doe has been made the representative of the company in the New England field.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of harness hardware, has increased its capital stock from $200,000 to $500,000. The increase was brought about by capitalizing $300,000 of the surplus.

Chicago Machinery Market.

CHICAGO, ILL., April 28, 1908.

Expectations of a marked improvement in the machinery market during the month of April have thus far failed of realization; for it is evident from the results of the past two weeks that, generally speaking, trade is lighter than at the beginning of the month. As is always the case when, as at the present time, the volume of business moving is insufficient to go round, it is being unevenly distributed. A few plants here and there may be found which are fairly busy, while others in the same or similar lines are either shut down or working to very short capacity. The same is true of dealers and is especially noticeable among the machine tool houses. Some report a fairly good trade for the week while in the experience of others it has been extremely dull; these conditions may be reversed the succeeding week. Outside of the tools comprised in the two lists of the Chicago, Milwaukee & St. Paul Railroad recently published in these columns there are no extensive requirements engaging the attention of the trade. None of this business has yet been placed, but it is believed that purchase will be

made without much delay since the vigorous prosecution of work on the Pacific Coast Extension indicates that it will be needed for shop equipment on that line before long. The meager amount of available business has developed a stress of competition that is bearing heavily upon the efforts of manufacturers and dealers to maintain prices. The wide range of prices in bids tendered on some recent public lettings demonstrates that some interests are willing to make deep cuts in order to secure the business. On a punch and shear of specific size and capacity required for a Chicago manual training high school ten bids were submitted, the highest of which was $1029, and the lowest $510; offers on other tools in the same list also exhibited wide differences. As a further indication of the trend of values it is this week reported that two important machine tool manufacturers are openly quoting reduced prices. All interests admit that continued dullness, with the strenuous competition it engenders, is a heavy handicap to the maintenance of prices; and as a matter of fact each interest is guided by its own individual views and circumstances in its efforts to secure business.

What is said to be the largest contract ever placed for like apparatus has been awarded by the Chicago Railways Company to the National Brake & Electric Company, Milwaukee, Wis. This contract comprises the air brake equipment for the 1200 new street cars which, in accordance with the Traction Ordinance the Chicago Railways Company, owning all of the West Side street railroads, will purchase and place in service within the next three years. The company expects to put about 550 new cars into service this summer, and orders for 400 of these cars have already been placed with the car builders. A large number of the cars on the South Side lines are now equipped with National air brakes and the placing of the present order may be taken as indicating their satisfactory service.

The motors for these cars will be supplied by the General Electric Company, Chicago, which has secured the contract for furnishing the equipment for 400 cars. Four motors of 40 hp. each are required for each car, making a a total of 1600, all of which will go into service during the present year. In addition to the machinery and equipment already purchased for the rebuilding of these lines considerably more will be required as the work proceeds, and it is not expected that it will be completed inside of three years.

Bids are being asked and proposals will be received up to May 4 by the city of Milan, Mich., on material, equipment and construction of a waterworks system. The specifications call for one 75,000 gal. metal tank and tower; two compound steam pumps of 500 gal. per min., or two triplex steam pumps of the same capacity, and two 50 hp. gasoline engines. About 367 tons of pipe will be required, together with 28 hydrants, and 29 gate valves from 2 to 10 in. The Riggs & Sherman Company, Toledo, Ohio, is the engineer in charge of the work.

Final plans and specifications for a waterworks system to be installed at Gratiot, Wis., are being prepared by Preston T. Hicks, engineer, Decatur, Ill., and will be ready within a few weeks. The system will consist of 300 ft. 8 in. well; deep well pump; engine of 10 to 15 hp., probably gasoline; 50 ft. steel tower, with 40,000 gal. cypress tank, located on a hill 102 ft. above the principal street; 5269 ft. of 6 in. and 681 ft. of 8 in. water mains; 17 hydrants, and six 6-in. gate valves. The estimated cost of the system is a little over $10,000.

Proposals will be received by Canon City, Colo., until May 20 for the furnishing of material and construction of about 8 miles of 26 or 30 in. conduit, to be made of either steel or continuous wood stave pipe; also a settling basin, filters, two clear water reservoirs, and other accessories required for the improvement of the Canon City waterworks system. Specifications for this work may be obtained at the offices of the city clerk on and after May 4.

The O. L. Packard Machinery Company, Chicago, has secured the Western agency for the Abrasive file sharpener made by the American File Sharpener Company, New York.

Bids are being taken by the Chicago Board of Education on the following tools, which are required for additional equipment in the manual training department of the Austin High School: Six speed lathes, two bearing head stock; one band saw, 36-in.; one power grindstone, with truing device.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 28, 1908.

While conditions have not improved, and indeed with some machine tool manufacturers are worse, investigations conducted with a special view to determining just what is being done in the selling markets develop the fact that machinery sales agents and supply dealers have during the month booked a fair volume of business.

The president of one of the largest of these companies, in summing up the results of the year so far, stated that he had done more business since the first of April than for the entire three months of the first quarter, and that his sales had been of practically all new machinery for shop equipment and for installations of municipal electric lighting and power developing plants. All local machinery dealers visited report an increasing demand for second-hand equipment, and nearly all accompanied by requests for special and additional discounts which were in but very few and special cases allowed. As a straw indicative of the attitude of the most representative dealers in this section on the subject of rebating and price cutting, one prominent agent had put up to him by a customer a bill of $2400 worth of machinery which he agreed to take if allowed an extra discount of 5 per cent. The manager refused, but got the order. Instances of this kind are numerous, and the dealers and manufacturers in this section who cut prices are very few. The philosophic members of the toolmaking districts argue that the demand just now is so extremely light that the few sales to be made at asked discounts would produce but a small income at a time when there appears no necessity to make sacrifices, and balanced against the difficulties to be encountered in restoring prices again by a raise suggest strongly the desirability of remaining firm.

Local sales agents have recently booked some excellent orders for municipal lighting and power equipment plants. Among these are a $30,000 plant for Troy, Ohio; machinery and equipment for a $10,000 lighting plant and for a $35,000 waterworks system for Madisonville, Ohio, a recently added suburb and part of Cincinnati, and $10,000 worth of lighting equipment for Carthage, another suburb of Cincinnati. Another municipal order that is expected to be placed soon is for the new lighting plant to be built in Lima, Ohio.

Manufacturers of dynamos, motors and ice manufacturing machinery report improvement in inquiries and sales, principally from the West. One large local concern, the Triumph Electric & Ice Machine Company, is going ahead with elaborate plans for its new plant in Oakley, where some six or seven of the largest tool manufacturing and other establishments are building new and modern plants. The company's improvements will cost in the neighborhood of $250,000 for buildings and equipment.

In the line of special machinery there is an improvement in tone, especially marked in the line of pumping machinery for mines and municipal plants. The John H. McGowan Company has just booked orders for two large pumping engines of 2,000,000 gal. capacity each, to be installed in mining districts; also an export order of 10 special hydraulic machines for the manufacture of plug tobacco, having a capacity for producing 8000 lb. of tobacco daily. The machinery goes to one of the largest tobacco manufacturing establishments in the world, and is to be installed in an extension of the plant. Suggesting the feeling of improvement in trade closely related to manufacturers of products along this line, this company reports that work is now going ahead on two orders for two large pumping engines, shipment of which had been held up during the months of the depression.

Local tool manufacturers are making preparations to entertain an annual visitor to this market from South America —Mr. Robert, representing Mantell & Co. of Buenos Ayres. He is expected in New York on April 30 and will make his headquarters with David S. Hayes in the Bowling Green Building. He spent but one day in Cincinnati, April 28. While here he met several representatives of large tool manufacturing concerns, who desired to learn more of the South American markets with a view to establishing agencies in the principal cities.

In the line of portable electric drills, local establishments report a fair demand with an increasing tendency. The Hisey-Wolf Machine Company, making a specialty of this line, is now thoroughly installed in its new plant at Cormany avenue and Township, Camp Washington, and is running on an average of 48 hr. per week, with a two-thirds force.

Lathe manufacturers view the situation variously. While some of the large establishments are practically, if not completely, shut down, others are running on a reduced schedule, and note an increase in both inquiries and sales. One of these during the week has sold a couple of good sized bills through a local machinery sales agent.

The Dean Gas Engine & Foundry Company, Newport, Ky., has assigned for the benefit of creditors. The two leading proprietors made personal assignments, with assets of $20,000 in each case, and combined liabilities of $16,500.

The Cincinnati section of the Associated Foundry Foremen held an enthusiastic meeting on Saturday evening, April 25, at the Palace Hotel in Cincinnati. Chemist George K. Elliott of the Lunkenheimer Company gave an address on "Notes in Alloys for Steam Valves and Fittings:" Chemist P. F. Wehmer talked on "Metal Fluxes," and John C. Burns of the Samuel C. Tatum Company told of "A Method of Making a Bonnet Valve with the Aid of Hard and Soft Metal in One Casting."

Some important improvements have recently been finished at the plant of the Edwards Mfg. Company, metal manufacturing specialists, Cincinnati. A new departure of this enterprising concern is the making of metal boats in 14, 15 and 16 ft. sizes for lake and river use.

H. E. Frazier of Rogers Brown & Co., Cincinnati, who at a recent meeting of the Board of Directors of the Ameri-

can Steel & Iron Company of Norwalk, Ohio, was elected vice-president and general manager, will move to that city and take active charge of a department of the works about June 1. There will be some changes made in the plant which will make possible a greater range in product and increase the output. A smaller bar mill will be built and some changes made in the furnaces. The new president, Charles R. Brown, will also move to Norwalk, it is stated. It is understood that the signatures of a majority of the creditors of the Norwalk Steel & Iron Company and the William Kavanaugh Company, from which the new company was formed, have been secured and the agreement is operative.

The Delphos Mfg. Company, Delphos, Ohio, is being enlarged and remodeled to accommodate the rapidly increasing business of the company which manufactures patent pump oil cans, dust pans, lanterns, galvanized iron and water spouting, &c. A building, 60 x 80 ft., is nearing completion. A large office building is to be erected also.

The Knecht Bros. Company, Cincinnati, founder and manufacturer of tools, has increased its capital stock from $50,000 to $75,000.

St. Louis Machinery Market.

ST. LOUIS, Mo., April 28, 1908.

The encouraging factor of an increase of a marked character in the inquiry for various kinds of machinery is reported by some of the manufacturers and dealers, though in case of the latter, it is to some extent for second-hand machines. With some manufacturers of small supplies, there is a disposition to manufacture for stock. In many of the large shops, a feature is the considerable volume of repair work in hand. The largest manufacturers are affected more by the depression on account of the large capacity of their plants, and those dependent on railroad equipment report business as very quiet.

The Central Shale Brick Company, Benoist Building, will require for its new plant, for which Peruque, Mo., is the shipping station, two dry clay brick presses, two dry pans, boiler, engine, screens, and steam shovel.

The Hall & Brown Woodworking Machine Company was awarded the contract to furnish for the new plant of the Gulf Lumber Company, at Fullerton, La., 23 machines, to be electrically driven from individual motors. The contract for the electrical equipment was awarded to the General Electric Company. The inquiry from saw mills and furniture companies has improved.

The Fulton Iron Works reports that it is in receipt of so many inquiries, it is kept busy figuring, but not many are closed up, for one reason or another. The company has received some business for export, among which is an engine for a sugar mill, one for Armour & Co., one for Racine, Wis., and three for the United Railway Company, St. Louis. It is getting a large percentage of local repair work, fully as much as last year.

The Marshall & Huschart Machine Company states that while there is at present very little demand, the prospects are better than at any time this year, and it expects within 30 days to see quite a revival in trade. A feature of the situation is considerable inquiry for second-hand machinery.

The O'Brien Boiler Works Company has just shipped three down draft smokeless furnaces to the Bower Heating Company, Milwaukee, for the Milwaukee Water Works. The company is getting out two 250 h.p. water tube boilers for Sedalia, Mo., Water, Ice, Light & Power Company; three 350 h.p. water tube boilers, Desloye Lead Company; 350 h.p. boiler, new Maryland Hotel, St. Louis; two 272 x 18 in. tubular boilers, Insane Asylum, Farmington, Mo. As inquiries are now coming in pretty lively, it expects to do more in the near future.

John Rohan & Co. are at work on some boilers for the Gray Construction Company, East St. Louis, and are making a marine boiler for United States Engineering Department, at Mobile, Ala., for steamer Pearl. The outlook is growing better, judging from numerous inquiries.

The American Brake Company reports some foreign business, mostly from the Continent and France in particular, though not up to last year. The demand is mainly for its locomotive driver brake, which is shipped to all countries.

The title of the Western Iron & Supply Company has been changed to W. G. Hagar Iron Company, and the capital stock increased from $150,000 to $200,000. The company will soon remove to its new home on Second street, between Clinton and Monroe streets, extending through an entire block to Main street. The new corporation will broaden its scope of operations and carry in stock, as heretofore, many thousand tons of iron and steel.

Government Purchases.

WASHINGTON, D. C., April 28, 1908.

The Isthmian Canal Commission will receive bids until May 18, Circular No. 438, for locomotive coaling cranes, shop machines, pumps and other supplies.

The Isthmian Canal Commission will soon ask bids for six 8½ x 12 in. reversing hoisting engines.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 12 for motors and until May 19 for drills, milling machines, &c.

The following bids were opened April 21 for machinery for the navy yards:

Class 1.—One turret lathe—Bidder 62, Compressed Air Machinery Company, San Francisco, Cal., $1318.30; 81, Frevert Machinery Company, New York, $754; 108, Harron, Ricard & McCone, San Francisco, Cal., $820.15; 185, Pacific Tool & Supply Company, San Francisco, Cal., $865; 254, Warner & Swasey Company, Cleveland, Ohio, $865.

Class 2.—One flat turret lathe—Bidder 114, Henshaw, Bulkley & Co., San Francisco, Cal., $1795; 182, Pratt & Whitney Company, Hartford, Conn., $2450; 185, Pacific Tool & Supply Company, San Francisco, Cal., $2150.

Class 11.—One motor driven lathe—Bidder 62, Compressed Air Machinery Company, San Francisco, Cal., $1081 and $981; 81, Frevert Machinery Company, New York, $788; 93, Garvin Machine Company, New York, $1190; 108, Harron, Ricard & McCone, San Francisco, Cal., $1091 and $1131; 114, Henshaw, Bulkley & Co., San Francisco, Cal., $1055; 145, Manning, Maxwell & Moore, New York, $1200; 185, Pacific Tool & Supply Company, San Francisco, Cal., $1285; 220, Springfield Machine Tool Company, Springfield, Ohio, $968.

Class 111.—One 3-ton hand traveling crane—Bidder 25, Brown Hoisting Machinery Company, New York, $975; 30, Alfred Box & Co., Philadelphia, Pa., $760; 53, Case Mfg. Company, Columbus, Ohio, $650; 58, Cleveland Crane & Car Company, Wickliffe, Ohio, $450; 103, Hoisting Machinery Company, New York, $490; 145, Manning, Maxwell & Moore, New York, $570; 161, Niles-Bement-Pond Company, New York, $623; 164, New Jersey Foundry & Machine Company, New York, $572; 169, Northern Engineering Works, Detroit, Mich., $575; 240, Vermilye & Power, New York, $730 and $760.

Class 121.—Two turbo generator sets, one motor and one switchboard—Bidder 91, General Electric Company, Schenectady, N. Y., $9705.

Class 132.—One gasoline or kerosene engine—Bidder 67, Drew Machinery Agency, Manchester, N. H., $2950; 80, Fairbanks, Morse & Co., New York, $3600; 87, G. & W. Mfg. Company, New York, $2482; 152, Model Gas Engine Works, New York, $1625; 163, National Electrical Supply Company, Washington, D. C., $2255; 171, August Mietz, New York, $3400; 173, Otto Gas Engine Works, Philadelphia, Pa., $2045.

Class 131.—One swing lathe—Bidder 85, Fitchburg Machine Works, Fitchburg, Mass., $950.

Class 132.—One automatic bevel gear planer—Bidder 98, Gleason Works, Rochester, N. Y., $1550; 265, Emil Callinan & Co., New York, $700.

Class 133.—One rivet spinning machine—Bidder 56, Thomas Crowther & Co., Boston, Mass., $115; 63, De Zouche, Hansen & Co., Philadelphia, Pa., $115.25; 145, Manning, Maxwell & Moore, New York, $114; 180, Prentiss Tool & Supply Company, New York, $115; 232, Tucker Tool & Machine Company, New York, $106.90.

Class 134.—One hand milling machine—Bidder 29, Becker, Brainard Milling Machine Company, Hyde Park, Mass., $230; 83, Fox Machine Company, Grand Rapids, Mich., $198.50; 145, Manning, Maxwell & Moore, New York, $190 and $195; 180, Prentiss Tool & Supply Company, New York, $215; 182, Pratt & Whitney Company, Hartford, Conn., $282.

Class 135.—One vertical milling machine—Bidder 29, Becker, Brainard Milling Machine Company, Hyde Park, Mass., $1083; 145, Manning, Maxwell & Moore, New York, $1135; 180, Prentiss Tool & Supply Company, New York, $1140.

Class 141.—One boring, drilling and milling machine—Bidder 136, Lucas Machine Tool Company, Cleveland, Ohio, $2675.

Class 161.—One guillotine frame bar shear—Bidder 54, Cleveland Punch & Shear Works, Cleveland, Ohio, $950; 116, Hilles & Jones Company, Wilmington, Del., $991; 184, Henry Pels & Co., New York, $1467; 225, Scully Steel & Iron Company, Chicago, Ill., $1350; 285, Barclay, Libby & Co., Charleston, S. C., $1545.

Class 162.—Three pressure blowers—Bidder 23, Brewster Engineering Company, Hoboken, N. J., $2494; 91, General Electric Company, Schenectady, N. Y., $2100; 187, P. F. & H. M. Roots, New York, $2494; 206, Sirocco Engineering Company, New York, $2850; 226, B. F. Sturtevant Company, Hyde Park, Mass., $1966; 267, D'Olier Engineering Company, Philadelphia, Pa., $1727; 283, Buffalo Forge Company, Buffalo, N. Y., $1853.

The following bids were opened April 20, Circular No. 434, for supplies for the Isthmian Canal Commission:

Class 1.—One tandem compound engine—Bidder 13, Ball Engine Company, Philadelphia, Pa., $4325; 60, G. & W. Mfg. Company, New York, $5973 and $6573; 63, Griscom-Spencer Company, New York, $5491; 72, International Electric & Engineering Company, New York, $5540; 110, Phœnix Iron Works, Meadville, Pa., $4800; 151, Williams & Wells Company, New York, $6733.

Class 3.—One belt driven punch—Bidder 47, Drew Machinery Agency, Manchester, N. H., $535; 56, Fox Bros. & Co., New York, $495 and $697; 72, International Electric & Engineering Company, New York, $811.13; 117, Prentiss Tool & Supply Company, New York, $729; 126, Joseph T. Ryerson & Son, Chicago, Ill., $765; 128, Scully Steel & Iron Company, Chicago, Ill., $630.

Class 4.—One power shears—Bidder 20, Bertsch & Co., Cambridge City, Ind., $400; 47, Drew Machinery Agency, Manchester, N. H., $385; 56, Fox Bros. & Co., New York, $317 and $465; 58, Frevert Machinery Company, New York, $894; 72, International Electric & Engineering Company, New York, $1116; 93, Motley, Green & Co., New York, $607.50 and $680; 102, Niles-Bement-Pond Company, New York, $444 and $529; 108, Henry Pels & Co., New York, $600; 117, Prentiss Tool & Supply Company, New York, $478; 126, Joseph T. Ryerson & Son, Chicago, Ill., $355; 128, Scully Steel & Iron Company, Chicago, Ill., $726.

Class 2, one power hammer, has been awarded to the Erie Foundry Company, Erie, Pa., at its bid of $310.

Under circular bulletin opening of April 14 the Buffalo Steam Pump Company, Buffalo, N. Y., has been awarded contract for one centrifugal pump and accessories, $1232.

Under bids opened March 3 for machinery for the navy yards the C. H. Wheeler Mfg. Company, Philadelphia, Pa., has been awarded class 21, two duplex boiler feed pumps, two duplex underwriter fire pumps, one duplex pump and receiver, $1959.

HARDWARE

NOTWITHSTANDING the objectionable features of department store business, there is no doubt that this method of distribution not only holds its own, but continues to increase. It may with unquestionable truth be alleged that these stores interfere with the small merchants in practically every line and often drive many of them out of business; that they generally make use of inexperienced, unintelligent and low priced help, and that in many cases they sell a cheap and inferior class of goods. They seem, however, to serve the public convenience and to attract people. They certainly sell goods, and in a commercial way are successful. Fortunately or unfortunately this is a final answer to objections that may be brought against them.

The attitude of the business man in regarding these great concerns should not be that of a critic, dwelling on their defects and emphasizing the manner in which they clash with vested interests and long established methods of trade. There is nothing suggestive or productive in fault-finding. The critical spirit does not promote initiative or enterprise or activity. The merchant who regards the growth of department stores and their intrusion perhaps into his own territory should look at them if he can impartially, and in something of the spirit of a disinterested student of trade methods and conditions, so that he may discover the reasons for their success and learn from them lessons which can be applied in his own business.

Without attempting to refer to the various admirable methods of these houses or the features in their management which are deserving of study by merchants who adhere more closely to the old ways, it is interesting to note, as a suggestive illustration, the manner in which records of sales are kept, and utilized in stimulating efforts in the various departments with a view to increasing the volume of business. This feature of the management of these stores is connected with the subdivision of responsibility, as the charge of different departments, of which there are ordinarily many, is entrusted to persons who are given large discretion in the conduct of their departments and are held responsible for results. In this way, indeed, many men who have not been able to carry on a business of their own along the old lines are often given good positions and opportunities for the display of their ability. With the records of daily sales which are kept, as described in another column, the department manager is constantly confronted with what has been done, and he is expected to make a record which will look well in the comparison. If, for example, in the first week of May, 1907, whether the department made a poor showing or a good showing it is up to him to make the corresponding week in 1908 justify his administration. If the sales last year were small he is expected this year to make them large. If last year they were large he is expected this year to make them larger. To accomplish this he does not wait until the end of April, but the purchase of goods, the advertising of the firm, the display made in the store and the prices to be charged, have all to be arranged for beforehand with a view to making good. Allowance will, of course, be made by the firm for the falling off in sales, on account of dull times, but woe to the manager whose record looks badly when compared not only with past figures, but more especially with what has been accomplished by the managers of other departments which are presumably subject to the same general influences as his is. Success or failure of his administration is shown in the cold mathematics of tabulated results, in which appear not only the aggregate volume of sales, but the profit which has been realized upon them. It is applying in the retail store methods which have long been used in great manufacturing establishments where the responsible manager is expected to break the record in lowering costs and increasing output. It is a severe test, but seems to have much to do with the success of the department store business.

In all this there is more than one lesson for Hardware merchants. An essential part of this system is the detailed and accurate records which are not only kept but used. Underlying its general adoption is the recognition of the fact that business in any particular line can be increased by well directed efforts. There is the cultivation of trade rather than waiting for it. There is also the utilization of the ability of responsible managers, so that the establishment gets the benefit of their skill and energy, in the use of what they deem the wisest and most resultful methods, and of whatever originality or ingenuity they may be able to make use of in the direction of the departments.

Condition of Trade.

Things are apparently righting themselves in the mercantile and financial worlds. Reasonable progress in the movement towards normal conditions is to be noted. The marked success which attended the putting on the market of the Pennsylvania Railroad bonds as well as other securities of similar character has had an excellent effect on the public, as indicating that confidence is returning and capital seeking investment where a short time ago it was distrustful. This recalls the familiar fact that in the country at large there is a great deal of money waiting to get busy, and a great deal of energy which is simply looking for an opportunity to employ itself in safe and profitable enterprise, commercial or industrial. This waiting attitude, in which it is necessary to repress impatience, is certainly doing good work and giving the business world a chance to recover from the effects of extreme activity and a too rapid pace. There is no doubt that the time is well made use of in working off high priced goods and material, collecting accounts, discharging indebtedness and generally getting things in shape. At the same time every concern has enough to do in the care of its current business, and in maturing plans and methods for its future operations. One indication of the feeling of manufacturers and the way in which they are endeavoring to improve their freedom from an inexorable pressure of orders which overtaxed their capacity is seen in the number of new goods which are being put on the market. Many of these are specialties or regular articles to be added to the manufacturers' assortments which have been in preparation for some time, but were held back for an opportunity to get them ready for the market and make due announcement. An illustration is also given in this of the confidence with which manu-

facturers are looking forward to a return to healthful business conditions.

Chicago.

It is now quite evident from the general trend of trade that the progressive gain made through the months of the first quarter will not be repeated in the present month; on the contrary, a final summing up of totals will doubtless show a decline in the aggregate volume of April business as compared with that of March, both as respects jobbers and manufacturers. The demand from consumers has not developed in the measure that was expected, even in the comparatively unaffected country districts where there has been no appreciable curtailment of purchasing power. The sentimental effect of outside conditions has spread a feeling of conservatism through the country that has operated to restrict buying. Several Eastern representatives, traveling through the Middle West, have recently reported that some of the Hardware jobbing houses outside of the principal centers are enjoying trade very nearly equal to that of the same months a year ago. Reports of this character from seven concerns represented the average business for the first quarter to be 95 per cent. of what it was for the same period last year. Even allowing for the known advantages in the present situation of the Western trade, this at first glance would appear to be quite out of line with current conditions; it may, however, be accounted for as a direct result of these conditions. Last year, when dealers were buying in round lots for future delivery, the time factor was not important, except as it related to promptness of delivery at an agreed date, and many ambitious buyers began to reach out to more distant markets; this meant the diversion of a certain amount of business from the nearby jobber to the manufacturer, or a more remote but large distributor, a defection that was unmarked in the midst of last year's overflowing business. Now that the dealer is supplying his wants by small purchases from day to day or week to week, it is important that his orders be executed and delivered with as little delay as possible. Under such circumstances he naturally looks to the nearest source of supply, which is the nearest jobber. It is not at all surprising, therefore, that augmented in this manner, the business of certain favorably located wholesale concerns should make the gratifying showing above indicated. No radical price revisions are reported, but in some lines of goods prices are by no means firmly maintained. Cast Hardware has felt the weakening influence of steady declines in Pig Iron, the end of which has apparently not yet been reached.

NOTES ON PRICES.

Wire Nails.—The mills are in receipt of more business than for a long time, as demand is causing jobbers to order more frequently, although the orders are not large, being restricted to actual needs. There is practically no delay in shipments, as manufacturers are in a position to fill orders promptly. Quotations continue as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

Chicago.—A fairly active demand for Wire Nails continues, but as the season advances and the attention of farmers is being diverted to seeding operations it is diminishing somewhat. However, the tonnage booked by the principal interest in April will be almost identical with that of March. Orders now coming in represent actual needs, and quick shipment is almost invariably demanded. In spite of reports to the contrary it is declared by those in position to know that the demand from consumers has not been overestimated by jobbers or dealers whose stocks have moved about in accordance with jobbers' estimates. Quotations are as follows: $2.23 in car lots to jobbers, and $2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The volume of business in Wire Nails which is being placed with the mills is gradually getting heavier, and while jobbers are not placing large orders, they are buying frequently, and the mills are entering more tonnage than for some time. There is no change in prices, but we are advised that the market is firm and that regular prices are being absolutely maintained. The mills are able to fill orders promptly, and there is no delay in shipments. Buyers continue to restrict orders to actual needs, and are keeping stocks as low as possible. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$2.05
Carload lots to retail merchants	2.10

New York.—Local demand shows a slight improvement, but is still along very moderate lines. Regular quotations are on the basis of $2.40 per keg for small lots at store.

Cut Nails.—Some mills are shut down and others are running on part time, to restrict accumulation of stock. Demand is disappointing, as there is little doing, notwithstanding the opening of the building season. The market is irregular, and concessions of 10 to 15 cents are being made on regular Steel Nail quotations, which are as follows: $2.05 base, per keg for carload lots at mill. Iron Nails generally should command about 10 cents more than Steel.

Chicago.—Small orders only are being placed, and these are not coming out in sufficient number to relieve the situation from dullness that amounts to almost complete stagnation. It was hoped that with the opening of building weather the demand would sensibly improve, but so far these expectations have had but scant realization. About the only signs of improvement discernable are in a slightly better demand for Iron Shingle Nails, but this is by no means up to normal. Regular prices are being shaded from 5 to 10 cents per keg. Chicago quotations are nominally as follows: Iron Cut Nails, carloads, to jobbers, $2.23; to retailers, $2.28; Steel, to jobbers, in carloads, $2.03; to retailers, $2.08.

Pittsburgh.—There is a somewhat better demand for Shingling Nails, but otherwise the Cut Nail market continues very dull and demand is small. Expectations of a heavier volume of business in Cut Nails with the opening of the building season have not been realized, and the tonnage moving from the mills is small. Prices continue to be shaded and the market on Cut Nails is practically open. We quote Steel Cut Nails at $1.90 to $1.95, f.o.b. Pittsburgh, for carload lots, and about $2 for small lots, to which freight to point of delivery is added. Iron Cut Nails are about $2.05, at maker's mill.

New York.—No improvement is seen in demand for Cut Nails in the local market. Regular quotations are on the basis of $2.30 per keg, for small lots at store.

Barb Wire.—The orders which are being placed with the mills show an increase over those earlier in the season. They are, however, with few exceptions, small, and cover immediate requirements only. Prices are being maintained at regular quotations, according to information from the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago.—The demand for Barb Wire shows no diminution, and is, if anything, growing a little stronger. Orders from the extreme North and Northwest, which on account of backward weather have been slow in coming out, are now being added to the general volume from other sections. Buyers are evidently not anticipating their requirements far in advance, since prompt execution and shipment of orders is uniformly required. We quote as follows: Jobbers, Chicago, car lots, Painted, $2.38; Galvanized, $2.68; to retailers, car lots, Painted, $2.43; Galvanized, $2.73; retailers, less than car lots, Painted, $2.55; Galvanized, $2.85; Staples, Bright, in car lots, $2.35; Galvanized, $2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—As the season advances demand for Barb Wire is showing betterment, and the volume of business being booked by the mills is heavier now than for some time. However, the trade continues to place small orders for actual needs, but these are frequent and represent a fairly heavy tonnage. We are advised the market is firm and that regular prices are being absolutely maintained by the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Plain Wire.—Orders continue to cover actual requirements, but amount to a fairly large demand. As mills are able to make prompt shipments there is no incentive to order beyond immediate demand. Prices are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Chicago.—While there is a fairly good demand for Fencing, manufacturers are keeping close to actual present requirements in placing orders. And as long as conditions do not favor an upward trend of prices and prompt shipment can be had from mills, the present policy of buying for needs as they develop will be continued. Prices are reported to be firmly maintained by the mills. Quotations are as follows: In car lots, to jobbers, $2.08, f.o.b. Chicago, and to retailers, $2.15.

Pittsburgh.—A fair volume of new business is being placed, demand for Woven and other kinds of Wire Fencing being fairly heavy, but it is much below what it was at this time last year. Orders received by the mills are small for actual needs and aggregate a fairly large tonnage. With no indication of any change in prices jobbers are pursuing the policy of keeping stocks as low as possible. We are advised that the mills are maintaining regular prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95

Rope.—Manufacturers of Cordage regard the amount of business for April equal to, if not somewhat in excess of, that for March. It is light, however, in comparison with the corresponding months of last year. While prices are steady in the main resourceful buyers are usually able to obtain concessions from regular quotations, especially if conversant with market conditions. Prices of Hemp continue low and manufacturers are supposed to have about worked up the higher priced stock that they had on hand. The following quotations, for base sizes, fairly represent the market: Pure Manila, 10¼ to 11 cents; B quality grades down to 8 to 9 cents; Pure Sisal, 7½ to 8 cents; lower grades Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

Nuts.—In our last issue it was inadvertently stated that in both Hot Pressed and Cold Punched varieties, blank and tapped Nuts are selling at the same price. We should have said that they are quoted at the same discount, since they are, of course, selling on different lists as heretofore.

Borax.—The prices of Borax remain about as they have been since late in January last. The market is represented by the prices given below, the differentials being governed by the quantities purchased, viz.: Carloads of 18 tons or more, refined crystals, in bags, 4½ cents per pound; in barrels, a ¼ cent advance, or 4¾ cents, and powdered, in barrels, 4¾ cents. Ton lots, refined crystals, in bags, 4¾ cents, and in barrels, 5 cents per pound. Powdered Borax in barrels is 5 cents per pound. The leading interest, which until recently has controlled the market in this country, in consideration of a yearly contract with it, shade the above quotations ¼ cent per pound, and if purchases are confined solely to that single source, the following further concessions are made, as follows: On a total of 5 tons, 1 per cent.; 25 tons, 2 per cent.; 50 tons, 3 per cent., and 100 tons and over during the year, 5 per cent. discount; the rebates being allowed after the close of the year's business.

Cotton Goods.—The weakness of the Cotton market has naturally had some unfavorable effect on miscellaneous lines of Cotton Goods handled by the Hardware trade, such as Clothes Lines, Mops, Twine, &c. Prices on these commodities are not firm and manufacturers have been announcing somewhat lower quotations.

Galvanized Ware.—Following reductions in Galvanized Pails, Tubs and Coal Hods recently made by leading manufacturers, a reduction of 5 per cent. has been announced in the balance of the Galvanized Ware line, including Ash and Garbage Cans, &c. A discount of 10, 7½ and 5 per cent. may be named to represent the market on these goods in a general way, although in the East some further concessions are obtainable.

Expansion Bolts.—Several manufacturers of Expansion Bolts, which are sold on the standard list, have sent out new discount sheets quoting prices effective after May 1.

Conductor Pipe and Eaves Trough.—Another new schedule of prices on Conductor Pipe, Eaves Trough, &c., has just been sent to the jobbing trade, representing changes which affect Eastern territory mainly. This district has now been subdivided into Northeastern and Eastern territories, the former including New England and the section immediately around New York, and the latter the balance of the territory formerly designated as Eastern, with the exception of North and South Carolina, which have been transferred to Southern territory. In the Northeastern District the prices recommended remain about the same, Conductor being quoted at 70 and 10 per cent. discount and Trough at 75, 10 and 15 per cent. For Eastern territory a lower figure has been named, which, however, does not represent much change from ruling prices. On Pipe the discount is 75 per cent. and on Gutter 80 and 2½ per cent. No quotations are given on Ridge Roll and Formed Valley for these territories, but it is expected that they will rule a little higher. In Central, Southern and Western districts prices remain practically unchanged. On Copper Pipe and Trough no prices are named, the market being irregular, although it may be represented in a general way by discounts of from 50 and 10 to 60 per cent.

Paris Green.—Manufacturers of Paris Green announced prices which took effect April 27, the base price being lower than that of 1907. The prevailing price of Arsenic is 4¼ cents and Sulphate of Copper is quoted at 5 cents. These values are unusually low and buyers of Green might think that the price of Paris Green should have been put on a lower basis than it is, in view of these facts. These low prices for raw material are, however, quite recent, while manufacturers of Green placed their orders some months ago, before the financial stringency developed, and at much higher than present prices. In connection with price it is interesting to recall that the base price announced on January 5, 1905, was 12 cents. The 1908 prices are as follows, subject to change without notice, f.o.b. New York, terms, 30 days net, or 1 per cent. cash in 10 days:

	Kegs.	Kits.					
	100 to	14-	Boxes.				
	Arsenic 175	28-56	2 & 5	Boxes.	Boxes.	Boxes.	
	kegs.	lb.	lb.	lb.	1-lb.	½-lb.	¼-lb.
10,000 lb. and over	21½	22	23	23½	24½	25½	26½
5000 to 10,000 lb.	22	22½	23½	24	25	26	27
1000 to 5000 lb.	23	23½	24½	25	26	27	28
500 to 1000 lb.	24	24½	25½	26	27	28	29
Less than 500 lb.	25	25½	26½	27	28	29	30

Window Glass.—In most sections only a fair demand for Window Glass is noted, notwithstanding more favorable weather conditions. Buyers do not appear inclined to stock up even though prices are low. Factory prices are not generally published, which would lead to the belief that buyers can practically name their own price, if sellers are anxious to dispose of their Glass. In New York and vicinity business is very quiet. The minimum prices recommended by the Eastern Window Glass Jobbers' Association are as follows: Single Strength, 90 and

25 per cent.; Double Strength, 90 and 30 per cent. discount from jobbers' list. These prices, are, however, not closely adhered to.

Linseed Oil.—The strength of the Linseed Oil market lies in the fact that stocks in the hands of sellers and manufacturing consumers are light, and that crushers are carrying comparatively light stocks of seed and Oil. Crushers are therefore not anxious to accept orders for delivery beyond June 1. There is more of an inclination on the part of large buyers to buy somewhat further ahead than they have been doing, though orders covering immediate requirements predominate. Local quotations are as follows: In 5-barrel lots, State and Western Raw, 40 to 42 cents; City Raw, 42 to 43 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

Spirits Turpentine.—The trend of the market has been downward during the week under review, and this has had the effect of keeping consumers out of the market. The falling off of price is attributed to heavy receipts of Turpentine at Savannah. The 30,000 barrels of tank stores held by the independents continue to be an uncertain factor in the market's future. The New York market is represented by the following quotations: Oil Barrels, 45½ to 46 cents; Machine Made Barrels, 46 to 46½ cents.

UNDERSELLING MAIL ORDER HOUSES.

GEORGE B. SPROWLS, who operates a good sized store in Claysville, Pa., is an intelligent, up to date merchant, who, by his enterprising methods, is able to do a very large business for a town of the size in which he is located. Besides the usual Hardware lines, he handles Bicycles, Sewing Machines, Paints and Varnishes, Implements, Vehicles and an extensive variety of allied specialties, which add much to the profits of the business. Mr. Sprowls is not worrying himself about hard times, as the recent volume of his business shows a 10 per cent. increase over the same period last year. This of course has only been accomplished by hard work. Another matter which he does not allow to trouble him is catalogue house competition. He has ideas of his own as to how this should be met, which perhaps may best be expressed in his own words. He writes as follows:

An Aggressive Policy.

We meet the catalogue houses on their own ground. They hire the best advertising writers to make people believe that they are giving greater bargains than we do. Now let any Hardwareman take their catalogue—he should keep one in the store all the time—look it over carefully, and he will be surprised to find that they are high in many things, so that he can easily meet their prices, counting nothing for freight, &c., and still make a good margin of profit. I have prepared a small folder showing about 110 items that I sell cheaper than they do. These I have mailed out to my customers, and have had good results from same. Lots of people have told me that they were ready to send away, but on comparing prices, found that they could not afford to do so.

Increasing the Volume of Business.

I believe in handling more goods at less profit and depending on volume of business to help out. I try to show my customers that I can do better by them than any mail order concern. It does not count with people to tell them that they should patronize home trade instead of sending away for goods. People don't want to pay the price of a local dealer when they can buy goods in adjoining towns or even far away at much less money. The day of old time profits has gone by. Forty or 50 per cent. will drive trade out of any community. Let merchants try to do two or three times as much business at less profit and see how quickly their trade improves. It is better to do this than have the money sent out of the community.

The comparison of prices referred to in Mr. Sprowls' letter is contained in a four page circular with the following statement on the front:

Believing that all parties will be glad to know how our prices compare with large catalogue houses in the cities, I have taken the latest catalogue and find our prices average very much lower than theirs. Of course they don't attempt to compete with us on Wire, Barb Wire, Nails, Lime, Cement, Plaster, &c. We recognize the fact that all parties are wanting to deal where their money will go farthest. Below will be found a comparison of prices which demonstrate conclusively that our prices average lower than any catalogue house in the United States, not counting anything for freight, &c.

On the succeeding pages is a list of over 100 items with Mr. Sprowls' price and the catalogue house price quoted side by side. This list is so interesting that we give it below, just as it appears in the circular:

	Our price.	Cat. house price.
5-shovel Lever Cultivator with outside handle braces	$2.50	$3.03
14-tooth Lever Harrows (cultivator)	2.75	3.08
Double Shovel Plows	1.65	2.18
Wing Shovel Plows	1.50	1.93
Garden Cultivators	2.00	2.34
Mattock	.40	.43
Grub Hoes	.30	.34
Pruning Shears	.25	.26
Bush Snaths	.50	.54
Bush Scythes	.65	.66
Clipper Corn Cutters	.15	.19
7-ft. Steel Land Rollers, three sections	19.00	19.85
8-ft. Steel Land Rollers, three sections	20.00	21.25
Disk Harrows	18.75	19.95
U Bar 60-tooth best Smoothing Harrow	9.50	9.78
Weeders	6.00	6.25
Triple-geared ball bearing Feed Grinder	21.50	25.95
Outside solid bronze oval headed Door Locks	1.75	1.98
Inside Door Lock to match, bronze plated	.50	.52
Double sliding Door Locks, to match	1.85	2.10
Sash Cord, per hundred feet	.65	.70
Galvanized Fence Staples, per pound, any quantity	.03	.04
Barn Door Hangers, roller bearing, per pair	.40	.47
Hay Carriers	2.85	3.00
Long double Harpoon Forks	.95	.99
Hay Carrier Pulleys, used with hay Rope	.15	.17
Tackle, Block Hoists and Wire Stretcher	.85	.87
Jack Screws, 2 x 10 screw, 20-ton capacity	1.85	2.04
Burr Steel Safety Lifts, No. 4	1.65	1.79
Burr Steel Safety Lifts, No. 5	2.00	2.29
Victor Steel Traps with chain No. 1, each	.10	.11
Best 10-in. ball bearing Ratchet Brace	1.50	1.70
Pedal mounted Grindstones	3.00	3.05
No. 1 Pipe Cutters	.95	.99
Perfection Miter Boxes	2.50	2.80
Copper Rivets, per pound	.35	.40
Blued Steel Squares	.95	1.15
Standard Buggy Wheels, per set, with tires	7.50	7.65
22-oz. Rubber Buggy Tops, fitted on buggy	8.00	8.89
Silver and Ohio King round point Shovels	.60	.83
Grain Scoops (scoop shovels)	.50	.53
Grass Catchers for lawn mowers	.50	.54
Standard Clipper Scythes	.60	.65
No. 726 Hog Fence, similar to theirs, per rod	.20	.25¼
No. 832 Hog Fence, similar to theirs, per rod	.23	.28⅓
No. 939 Hog Fence, similar to theirs, per rod	.25	.31½
12-ft. single drive Gates	5.85	5.98
600-lb. Platform Scales	7.50	7.58
¾-in. Brass Bibb Cocks	.75	.92
⅝-in. Brass Globe Valves	.30	.31
¾-in. black Gas Pipe, per foot	.03⅓	.04
1-in. black Gas Pipe, per foot	.04⅔	.06
¾-in. best grade Manila Rope, per foot	.02⅓	.03
Same grade Saddle, Morgan tree	6.00	6.99
Same single strap Runabout Harness	14.50	15.45
Same solid Nickel Breast Collar Harness	15.00	16.79
Low down Handy Wagon, same quality	20.00	22.86
Same quality Buggy	55.00	59.50
Same quality Buggy	44.00	44.95
Same quality rubber tired Runabout	60.00	61.05
Same automobile seat Buggy	55.00	56.50
Same quality Sewing Machine, automatic	15.00	15.75
Same quality Sewing Machine	12.00	13.95
16-in. Hot Blast Stoves	11.00	12.86
Heavy Cast Sinks, 18 x 30	1.25	1.26
Round Rotary Washers	5.00	5.45
Best 2-cylinder Force Pump complete with 30-ft. well	12.15	15.12
Anti-freezing Lift Pumps	2.95	3.20
Low down Tank Pumps	5.50	5.67
Crimped Leathers for low down Tank Pumps	.25	.29
4-qt. Enterprise Lard Presses and Sausage Stuffer	4.40	4.53
Best grade Harness (shoe thread) Thread, per ball	.10	.12
Double bow Sheep Shears, per pair	.85	1.05
Halter Chains, No. 000	.20	.21
Box Loop Shaft Tugs, ⅞-in., per pair	.50	.72
3-in. Breast Collar with 1¼-in. traces	3.00	3.29
Double team Breeching with 1-in. side straps	4.00	4.39
Buggy Hames with 1¼-in. Traces attached	2.75	2.93
1-in. Side Straps, per pair	.75	.94
1-in. Hame Straps, sewed with two loops	.13	.15
1¼-in. Leather Neck Halters	.85	.88
3-buckle Over Checks	.50	.60
Single Buggy Lines, 1 x 1⅛ round edge S. B.	1.50	2.13
Best grade heavy ¾-in. Brass Team Bridles	2.75	3.25
Check lines, 1 in. by 18 ft	2.75	3.49
Check Lines, 1 in. by 20 ft	3.00	3.71
Same kind of Side Saddle	6.75	7.37
Same quality Texas Saddle	12.00	12.33
Mrs. Potts' Sad Irons, per set, nickel plated	.85	.93
⅜-in. black Malleable Elbows	.03	.04
½-in. black Malleable Elbows	.04	.05
⅝-in. wrought iron Couplings	.03	.04
1-in. wrought iron Couplings	.05	.06
¾ Malleable Unions	.08	.09
⅝ Bushings	.02	.03
Rough Brass Stop Cock, T handle, ¾	.50	.55
Dry Batteries, 2½ x 6 in., No. 6	.20	.21
H & R nickel plated Hammer Revolver	4.75	4.82
H & R nickel plated Hammerless Revolver	5.25	5.45
Dry back Hunting Coats	2.85	3.09
Mouse Traps, three for	.07	.08
18-in. Butcher Saw	.70	1.05
Pearl Tang best grade Razors	2.00	2.08
Toilet Clippers	.50	.54
Storm glass Thermometers	.15	.18
3½ x 3½ Old Copper Butts, per pair	.15	.21
Old Copper Sash Locks	.05	.06
Double Door Hangers and Track for parlor doors	3.00	3.05
Malleable Screw Pin Clevises, 2 x 4½	.08	.10

R. R. Roberts, Dunning, Neb., is establishing a new Hardware, Stove, Tinware, Implement, Paint, Sporting Goods and Harness store.

A Handsome Fishing Rod Case.

AMONG the many noteworthy features attracting the attention of a visitor in the splendid Hardware store of the John E. Bassett & Co., New Haven, Conn., is the wall case for the accommodation of Fishing Rods, a portion of which is shown in the accompanying illustration. The case is perhaps 8 ft. long and 4 ft. high. It has sliding glass doors in front and is also illuminated by incandescent lights with reflectors inside. The Rods rest on light brackets made for the purpose, a pair of which are shown in Fig. 2. Strips of felt glued on are used to cover the upper edges of the brackets. This keeps them from scarring the Rods, which are naturally put up and taken down frequently during the season in the course of handling and showing stock. The brackets are fastened to the back of the case by screws inserted through projecting shoulders, as shown. Advantages possessed by this case are not only the attractive effect of the Rods as a whole, showing the size and variety of the stock, but the fact that each separate Rod may be distinctly seen and easily got at, if desired. Another good feature is the fact that each Rod lies in a good bright light, there being nothing solid to obstruct the light of the electric reflectors disposed about the case. These lights are of course on a switch, which may be turned on when the Rods are being shown.

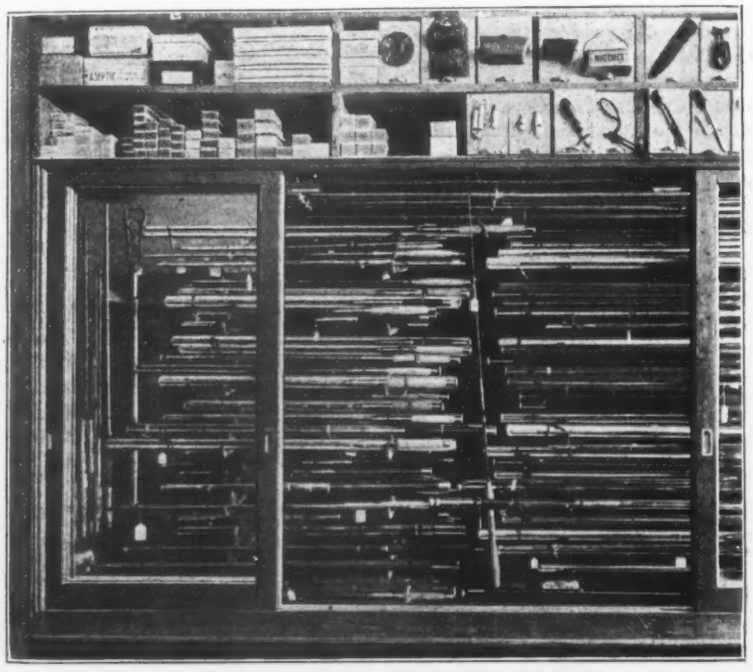


Fig. 1.—Wall Case of Fishing Rods.

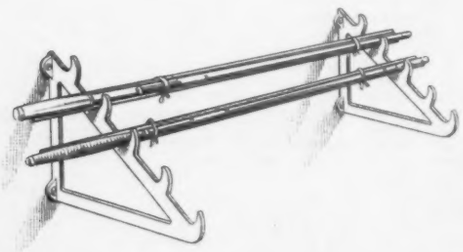


Fig. 2.—Brackets in Wall Case Accommodating Rods.

Delaware Marine Supply Mfg. Company's Catalogue.

IN the catalogue of Marine Hardware, Car Trimmings, Ship Fittings, Port Lights, Hinges, Hex Nuts, Ferrules, &c., issued by the Delaware Marine Supply Mfg. Company, Wilmington, Del., special attention is merited by the price-lists of Fast Joint, Loose Joint and Loose Pin Butts. Great care has been taken by the company to make these lists as complete as possible, including in them all information desirable from the viewpoint of a buyer. The arrangement and scope of the lists will be clear from the accompanying reproduction. Finishes are lettered and described, and the size of Screws is given, together with the amount to be added to the list if Screws are furnished with the Butts. Hinges are made in seven different finishes, from A to F, and Hinge tables giving the number and size of Screws required for each Hinge, together with the price for same if they are to be furnished.

PRICE LIST FOR LOOSE PIN BUTTS.

NOTE :—Prices are for one dozen pair of butts and do not include screws. If screws are wanted add to the net price of hinge the cost of screws as given in the table. The prices for screws are net.

	Size of Screws	C Dull Pin. Yellow Brass	D Dull Fin. Bronze	E Polished Yellow Brass	F Polished Bronze	G Nickel Plated	H Antique Brass	K Antique Copper
1½ x P	5 x ½	$ 4 19	$ 4 48	$ 4 57	$ 4 83	$ 5 10	$ 5 32	$ 5 32
Add for Screws		20	24	30	34	38	38	38
1½ x 1¾	6 x ⅜	4 30	4 65	4 69	5 01	5 28	5 50	5 50
Add for Screws		23	28	33	38	42	42	42
1½ x 1½	6 x ⅜	4 42	4 83	4 82	5 20	5 46	5 68	5 68
Add for Screws		23	28	33	38	42	42	42
1½ x 1¾	6 x ⅜	4 55	5 02	4 96	5 40	5 66	5 88	5 88
Add for Screws		23	28	33	38	42	42	42

Portion of Price-List from Catalogue of Delaware Marine Supply Mfg. Company.

Syndicate Buying Litigation.

SYNDICATE buying, an institution which seems to have become pretty firmly established in the Hardware trade, has for some time, as is generally known, been under the regulation of the National Hardware Association, which has taken the position that only the larger jobbing houses are entitled to buy direct from the manufacturers and at prices obtainable by this method. It has been the practice of the leading purchasing agents who are located in New York to submit from time to time to the secretary of the association lists of their clients and to secure his approval of new accounts which they proposed to take on, the result being to restrict the scope of their business and limit their service to merchants whose standing as jobbers was recognized by the leading wholesale houses. The task thus assumed by the National Hardware Association of exercising supervision over the business of others must be regarded as a difficult one, involving many decisions which call not only for fairness and impartiality, but for a thorough knowledge of the facts which may often be difficult to obtain. Considerable friction has resulted and dissatisfaction has frequently been felt by the parties affected by various rulings which operated against the syndicate buyers or their prospective patrons. A short time ago the firm of W. B. Fox & Brother, New York, a syndicate buying house of many years' standing and enviable reputation for honorable dealing, notified the secre-

tary of the National Hardware Association that it would no longer recognize his supervision, stating, however, that it did not propose to deviate from the conservative lines on which its business had been conducted in the past. The firm, indeed, maintains that its list of clients remains substantially the same and contains the names of no houses which would not pass as jobbers under a consistent interpretation of previous rulings. Following this declaration of independence, the firm has evidence that letters calculated to prejudice its standing as a representative of jobbing interests have been sent to manufacturers by a number of prominent jobbers. These letters allege that the firm is representing retail merchants and quotes to them extreme jobbing prices. This statement W. B. Fox & Brother deny, and as they regard it as intended to injure their business, they have authorized their attorneys to bring suit on this ground against a prominent jobbing house.

Texas Hardware Jobbers' Association.

THE annual meeting of the Texas Hardware Jobbers' Association was held in San Antonio on the 17th and 18th inst. A larger percentage of the members and a greater number of manufacturers' representatives were in attendance than at any former gathering. It was, in fact, the most interesting and profitable meeting the association has ever held. There was considerable discussion during the convention on such subjects as terms, cash profits, freight rates and railroad legislation and accounts. Prominent among visiting representatives of manufacturing interests was Frank Baackes, vice-president of the American Steel & Wire Company, who made an address which was listened to with much interest and attention. Brief addresses were also made by a number of traveling salesmen, including E. F. Cooper, S. H. Roberts, W. E. Mayo, Frank Lowe, S. Reimers, Henry J. Turner, R. J. Jackes, J. C. White, Fred Huggins, G. R. Stafford, George M. Baker and Fred W. Devy.

The following officers were elected for the ensuing year: Chas. E. Nash, president; E. A. Peden, first vice-president; Jno. L. Keith, second vice-president; R. F. Bell, secretary-treasurer. Executive Committee: F. A. Heitmann, G. A. Trumbull, W. L. Sanford, R. L. Penick.

The selection of time and place for the next annual meeting was left to the Executive Committee.

The members of the association present included the following houses: H. S. Bettes Hardware Company, Paris; Nash Hardware Company, Ft. Worth; E. L. Wilson Hardware Company, Beaumont; Penick-Hughes Company, Stamford; Peden Iron & Steel Company, Houston; McLendon Hardware Company, Waco; Roberts-Sanford-Taylor Company, Sherman; Huey & Philip Hardware Company, Dallas; Bering-Cortes Hardware Company, Houston; Heusinger Hardware Company, San Antonio; Morrow-Thomas Hardware Company, Amarillo; San Antonio Hardware Company, San Antonio; Joseph Myer Company, Houston; Wm. Henry & R. E. Bell Hardware Company, Ft. Worth; Moroney Hardware Company, Dallas; Tatum Hardware Company, Corsicana; Adoue-Blaine Hardware Company, Houston.

Among the manufacturers who were represented at the meeting were the following: Henry Disston & Sons, Philadelphia, Pa.; E. C. Atkins & Co., Indianapolis, Ind.; M. Hartley Company, New York City; Harrington & Richardson Arms Company, Worcester, Mass.; Enterprise Mfg. Company, Philadelphia, Pa.; Phœnix Horse Shoe Company, Chicago; Pike Mfg. Company, Pike, N. H.; Gandy Belting Company, Baltimore, Md.; American Steel & Wire Company, Chicago; American Sheet & Tin Plate Company, Pittsburgh; Colorado Fuel & Iron Company, Denver, Col.; Ludlow-Saylor Wire Company, St. Louis, Mo.; National Enameling & Stamping Company, St. Louis, Mo.; Sargent & Co., New York City; E. I. Du Pont De Nemours Powder Company, Wilmington, Del.; American Fork & Hoe Company, Cleveland, Ohio; United States Graphite Company, Saginaw, Mich.; Peters Cartridge Company, Cincinnati, Ohio; Youngstown Sheet & Tube Company, Youngstown, Ohio; Jackes-Evans Mfg. Company, St. Louis, Mo.; Winchester Repeating Arms Company, New Haven, Conn.; American Screw Company, Providence, R. I.; Schlueter Mfg. Company, St. Louis, Mo.; Landers, Frary & Clark, New Britain, Conn.; American Wringer Company, New York City; U. S. Hame Company, Buffalo, N. Y.; Columbian Hardware Company, Cleveland, Ohio; Lamson & Sessions Company, Cleveland, Ohio.

Members and Manufacturers' Representatives at the San Antonio Meeting of the Texas Hardware Jobbers' Association.

A. A. Peterson, formerly of Maple Park, Ill., has purchased the Hardware stock and business of H. T. Janssen, Sterling, Ill., which has been organized under the name of the Sterling Hardware Company. It is the purpose of the new company to remodel the store now occupied and enlarge the stock.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

BRAINERD MFG. COMPANY, East Rochester, N. Y.: 1908 supplement No. 1 to 1907 catalogue, referring to special brass, bronze and steel Hardware, including hinges, hasps, side stops, corners, chest handles, catches, hook lifts, &c.

PENN HARDWARE COMPANY, Reading, Pa.: Price-list circulars, referring to Screen Door trimmings, and Penn window stop adjusters.

CONSUMERS' COMPANY, Chicago: Illustrated booklet, referring to Useeit water coolers and accessories.

A. G. SPALDING & BROS., 124-128 Nassau street, New York: Handy catalogue of spring and summer athletic goods for the season of 1908.

DAVID BRADLEY MFG. COMPANY, Bradley, Ill.: Illustrated booklet, referring to MacKinnon Farm Wagons, gears, parts, &c.

I. N. BURDICK, 136-144 Wooster street, New York: Illustrated circular, showing a varied line of Lock Corner Trays, Store and Shop Furniture, including Counters, Pigeon Hole Cases, Drawer Cabinets, Portable or Sectional Shelving, &c.

AMERICAN FILE SHARPENER COMPANY, 296 Broadway, New York: Illustrated catalogue of its American File Sharpening Machine, by means of which, with a blast and carbo flynt, a patented abrasive furnished in bulk, used files can be resharpened several times. A partial list given of users of the machines contains names of some of the leading manufacturers of the country.

CRESCENT TOOL COMPANY, Jamestown, N. Y.: Catalogue illustrating a new line of Lineman's Pliers recently added to the line of Combination Pliers, which the company has manufactured for the past six years.

W. H. COMPTON SHEAR COMPANY, Newark, N. J.: Illustrated catalogue of Shears, Scissors, Tinners' Snips, Razors, &c.

AUTOLIGHT & MOTOR SUPPLY COMPANY, Philadelphia, Pa.: Illustrated catalogue of Automobile Accessories and Tools.

MAST, FOOS & CO., Springfield, Ohio: Illustrated catalogue, No. 34, describing line of Imperial Windmills and Galvanized Steel Towers.

YALE & TOWNE MFG. COMPANY, 9-15 Murray street, New York, has had printed in leaflet form photographic reproductions of its show window, which at frequent intervals has been artistically dressed with examples of the numerous kinds of Builders' Hardware made by the company. Recognizing the importance of tasteful displays and to assist the merchant in city or town the arrangements have been of such character as can be readily reproduced, the detail being sufficiently clear to enable clerks with a taste for such work to follow the scheme or modify any one of perhaps 20 along original lines. The prints are full page size, and for gratuitous distribution on application.

ROBERT H. INGERSOLL & BRO. have removed from 51 Maiden lane, New York, to the new Frankel Building, 45-49 John street, where they have an entire floor for business offices and sample rooms, in which their numerous styles of Watches are shown, from the dollar quality to more expensive grades.

C. C. PUTNAM & SON, Putnamville, Vt., have placed an agency for the sale of Putnam Spring Clothes Pins with the Robert F. Haight Company, 6 East street, San Francisco, Cal., who will have a stock of the Pins on hand and be able to make deliveries from that city.

CONTENTS.

Final Assault of the Postal "Reformers."

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., April 28, 1908.

THE advocates of parcel post and other so-called reform measures related to the postal service are planning a final assault upon Congress in the closing days of the present session, which it has been practically decided will terminate May 15. A mass meeting of the "reformers" will be held in this city on May 5, the objects of which are set forth in the following notice published here at the instance of the Postal Progress League:

A mass meeting of all organizations and individuals favoring postal reforms has been called to meet in this city Tuesday night, May 5, under the auspices of the Postal Progress League. It is announced that Postmaster-General Meyer will address the meeting, which will be for the purpose of impressing upon Congress and the President the importance of enacting legislation which has been urged by the post office officials.

The Postmaster-General has recommended to the present Congress the establishment of a local rural parcel post, as a means of eliminating the postal deficit, and as being of great value to 4,000,000 patrons of rural routes. He also urged the immediate establishment of postal savings banks. Consolidation of the third and fourth classes of mail matter at the old rate of 1 cent for each 2 oz. has been urged by the Department for many years.

Mr. Cowles' Open Letter to Congress.

The members of the Senate and House upon whom pressure is to be brought at the coming mass meeting are already in receipt of communications from James L. Cowles, the secretary-treasurer of the Postal Progress League, who has prepared what he styles an open letter addressed to all members of the Sixtieth Congress. In this letter Mr. Cowles says:

Postmaster-General Meyer calls attention to the fact that a cheap local rural parcel post could be made to eliminate the postal deficit. We call attention to the fact that such a service would prove an infinite convenience to 4,000,000 voters who, with their families, live on our rural routes. For the lack of legislation easily within your power these voters are now subjected to great and unnecessary inconvenience and expense. The vehicles for the performance of the proposed service are at hand, and the public is paying for them.

You have stated that "upon the postal service more than upon anything else does the general economic, social and political development of the country depend." In view of these facts, we trust that immediate consideration may be had upon the various bills before the Postal committees of the House and Senate and that from them some bill may be chosen or some other bill be formulated and enacted into law.

We also ask your immediate and favorable action upon H. R. 257, providing for the consolidation of third and fourth class mail matter at the third-class rate, as urged upon Congress by the Post Office Department for the last 17 years.

This proposal has been indorsed by the legislatures of Connecticut, Rhode Island and Massachusetts, by the National Grange and by the American Federation of Labor. It simply asks that our parcel service shall be brought up to where it was in 1874. It simply asks that blank books and other general merchandise shall be posted within the United States as cheaply as printed books are posted round the world. Failure on the part of the Postal committees of the House and Senate to grant hearings on the various postal bills before them leaves us only this method of making known to you the wishes of the public whom we represent.

A Carefully Selected Date.

The selection of May 5 as the date for holding a mass meeting in this city exhibits considerable shrewdness. The annual Post Office Appropriation bill, which passed the House more than a month ago, has been held up in the Senate Post Office Committee owing to the serious illness of Chairman Penrose. Senator Penrose is now convalescent and is expected to return to Washington during the first week in May, when the consideration of the appropriation bill by the Senate committee will be begun. It is apparent, therefore, that the postal reformers are counting upon making a demonstration in this city while the postal bill is under consideration in the Senate committee, relying upon creating sentiment for the rural parcel post amendment heretofore presented in the Senate by Senator Simmons, who is a member of the Post Office Committee. The Burnham and Kean bills, which respectively embrace the Postmaster-General's two projects of rural parcel post and the reduction in the general merchandise rate from 16 to 12 cents per pound, are also before the committee and could be added to the appropriation bill if a sufficient number of votes could be mustered.

The Opponents of Parcel Post

must be prepared to meet the pressure now being brought to bear upon Congress by the advocates of these schemes and must be in position to act promptly and effectively in the event that the Senate committee reports favorably any of the parcel post propositions as riders to the appropriation bill. Such amendments will be subject to the point of order that new legislation cannot be added to appropriation bills except by unanimous consent, and it will only be necessary, therefore, that some Senator be induced to raise the point of order to eliminate them from the pending measure. If the committee adopts them, however, it will require strong and well directed effort to induce even one Senator to oppose the action taken, and for this reason it may be a difficult task.

Should the bill pass the Senate with a parcel post rider it will mean a hard fought battle in the conference committee which will then be appointed to harmonize the differences between the two bodies. This committee will consist of the three ranking members of the Senate and House Post Office Committees. The present disposition of the House committee is hostile to all these projects, but if the Senate should incorporate any of them in the bill there would be an even chance that they would be retained in the measure as finally signed by the President.

The point to be emphasized is that the crisis has been reached in the year's campaign. All the planning and the active work that has been done by the organizations in the trades opposed to parcel post will go for naught unless prompt action is taken at this time. Neglect now may mean the incorporation of a rural parcel post amendment to existing law that in another year will be enlarged into a general parcel post provision which no amount of work will prove sufficient to wipe off the statute books for at least a generation.

Position of New York Merchants' Association.

Considerable curiosity is expressed here by members of the House with regard to the underlying purpose of the Merchants' Association of New York in memorializing Congress in the interest of the rural parcel post. The association has no direct interest in booming the rural parcel post scheme, and the solicitude shown for the welfare of the country merchant is entirely unprecedented. One member of the House suggested to the correspondent of *The Iron Age* that a general parcel post would probably prove of advantage to the merchants of the big cities and that if Congress should favor the country retailers this year with a rural parcel post it could not logically refuse next year to extend the same facilities to the business men in the great commercial centers of the country.

Personal Letters Effective.

The opponents of the parcel post should bear in mind that they can be of great assistance to their friends in Congress at this crisis if they will write personal letters to them setting forth the reasons for their opposition to the rural parcel post, which is now being advocated so strongly by individuals who could not hope to profit directly by it, and yet who are not given to wasting much effort in purely philanthropic enterprises.

THE C. W. GAUSE COMPANY, San Francisco, Cal., on April 25 removed its office and salesroom to 718 Mission street, occupying room 305 of the Herman-Weil Building. This company acts as sales agent for a number of prominent manufacturers of Hardware and kindred products for domestic and export trade, and also maintains a Portland, Ore., office at 306 Oak street.

HENRY B. SPERRY, who for 15 years operated the Alexander silica brick plant at Akron Ohio, and more recently has been manager of the fire brick department of the Robinson Clay Product Company at Akron, is now devoting all his attention to the Spirit Level Works of the Baker-McMillen Company, Akron, of which he is president and treasurer.

KEEPING STOCK.

A PAPER BY H. C. MEYER, ROCKDALE, TEX.

THE subject, "Keeping Stock," is very important in its nature, yet little can be said on the question, it being one of action, one of work, rather than of words.

The arrangement of a Hardware store and the allotment of space to the different goods will depend largely upon the location of the store, its size, whether large or small, and the variety of goods carried; on the size of the salesroom and the extent of other accommodations for storing goods, such as warehouse, &c.; the class of trade whose wants are to be studied and supplied, and the individual taste and judgment of the merchant. Manifestly there is no single method of arrangement which can be recommended or followed in all cases, for each merchant has a different problem to solve, the elements of which are given in the special circumstances under which he is carrying on his business. Then again, the proper arrangement and display of goods depends on the location of counters, if any, shelving, racks, &c., and the expense which of necessity must be considered.

The Position in the Store

which should be assigned to the different kinds of goods should have careful consideration. In some stores this matter is apparently overlooked, and the manner in which the goods are distributed in the different locations is inconvenient and in many ways objectionable.

It is obvious that in every store there are locations which are more prominent than others for the keeping and the displaying of goods, and the merchant should be careful to use such conspicuous places to the best advantage. It is generally a good rule to assign such places to attractive goods, as, for example, Cutlery, Silverware, fine China, Baseball, Tennis and other Sporting Goods, or such other articles the sale of which is specially facilitated by their display. In this class of articles belong the large variety of House Furnishing Goods and Hardware specialties, which, attracting the attention of the observer and customer, often lead to purchases.

Goods a Little Outside Hardware.

If you are carrying goods which are not likely to be thought of as sure to be found in a Hardware store, it is desirable that they be given places where they will be seen, as your patrons may not otherwise be aware of the fact that you are carrying them, while such goods as Nails, Screws, Bolts and kindred articles which belong distinctly and solely to a Hardware stock can be given a less conspicuous position. It is also desirable and necessary to have

Seasonable Goods Near the Front

of the store, where they will be seen by all who enter, and the same principle applies to any line of goods the sale of which is to be specially pushed. If you have no show window and are, as is the practice in a good many places, displaying goods in front of the store, you should be careful to display such goods to good advantage, and especially should you see to it that these goods are fresh and clean. The best and proper way is to always sell the sample and replace with a new one after customer leaves the store. Frequently I see samples, such as Washing Machines with hoops off and weather beaten, Wash Kettles rusty from age, Plows and other implements rusty and paint beaten off, steel goods with rusty blades and handles clearly showing age, as well as other articles too numerous to mention, displayed in a dilapidated condition, all of which shows a bad taste, and I cannot imagine a more unseemly sight from a display point of view, and it clearly shows a lack of taste and enterprise and of good judgment.

Similar Goods Together.

Another general principle which should be followed is to keep similar goods together as far as possible; for instance, Builders' Hardware should be together, and so should Carpenters' Tools and Blacksmiths' Tools, &c. In the application of these principles there is opportunity for much careful planning, but time thus spent will certainly bring beneficial results.

Division of Shelving.

The shelving on one side should be for Hardware such as is usually bought by men, and on the other for household goods, such as are usually bought by women. The shelving on the Hardware side should be assigned to goods as follows: Guns and Ammunition and kindred goods, Builders' Hardware, Carpenters' Tools, Blacksmiths' Tools, Paints, Varnishes and Brushes, &c. The class of goods on the household goods furnishing side is made up of the following: Lamps and Lamp Goods, Tin and Granite Ware, China and the long list of household specialties. In addition to the general outline mentioned, it should be the aim of a merchant and his employees to make goods on shelves always look fresh and so arrange them that the shelves always look well filled, which can easily be done. Dust should never be allowed to settle on goods or shelving.

The Show Window.

It has been said "You could not hire the services your show window will give you for the price of two clerks, if you use it right." In some instances this may be overdrawn, while in others it is true; hence the best possible use should be made of it. Many merchants do not give this method of displaying and showing their goods the amount of attention they should, and do not seem to realize its full value. Many think it unnecessary labor and expensive. With these ideas I cannot agree. Personally I believe that window display is one of the most valuable methods of advertising, and frequently the appearance of a merchant's show window is an index to his business ability.

Many seem to think that it is a difficult matter to dress up a window in a Hardware store. I believe it requires a great deal of ingenuity to get a really attractive window, but in this, as in many other things, "practice makes perfect." The large variety of goods handled in a Hardware store gives a

Wide Range for Attractive Displays.

It is well to leave this to one person, who will soon begin to take a pride in the matter and turn out windows that will be a surprise and prove to be trade getters. A window display can be greatly strengthened and be made more effective by the use of show cards, which should call attention to the display in a brief and clear manner, and it is essential to have neat price cards showing the price of each article. Keep windows clean and change your display often. This is very important. If you leave a display too long people will lose interest in your windows, and as a result you will lose the advertising value of your display.

How to Keep Stock Complete.

Akin to stock keeping is the buying of goods, for without judicious buying your stock will necessarily be broken. Many merchants depend on traveling salesmen to call their attention to goods needed, and in fact depend on the salesman to say what he should keep and sell. This is a condition a merchant should never allow himself to get into.

When there are a number of clerks employed the best plan I can suggest is to supply salesmen with pocketbooks with perforated sheets, and when an article becomes low or entirely out it should be the duty of the salesman at once to note this in his pocketbook, and tear out the sheet on which such notation is made and send same to the office, either noting thereon goods that are needed, or in case the salesman is in doubt as to what is wanted, he should take an inventory of such articles as are on hand, from which the buyer can make his order. For instance, should the salesman note that the stock on Monkey Wrenches was running low, he could take an inventory of the stock of Wrenches, send such list to the office, stating that such represented what was on hand. In a well regulated house these orders should go to the factory or jobber in first mail. Never wait for to-morrow. This is too important and necessary if you want to keep your stock complete.

The Traveling Salesman.

It is well, and common courtesy requires, that you treat the traveling salesman with respect and give him your

orders when on file, everything being equal, but you should never disregard your own interests. Your own interest and that of your patronage should stand prominently above all. Many contend that they need the salesmen to keep them posted. This is not altogether true. There are other methods by which you can keep yourself posted, and it should be your aim to have prices before you at all times. My experience has shown the best method to be a card index, which should be on your desk for ready reference and should be kept up to date at all times.

THE DOMINION OF NEW ZEALAND.

II.

BY JOHN L. SARDY.

New Customs Tariff.

LAST July a new customs tariff went into effect in New Zealand. Some of its changes are as follows:

Surgical and Dental Instruments free under the old tariff were advanced to 20 per cent. ad valorem, whereas Automobiles paying 20 per cent. ad valorem were made free under the new tariff. Instruments being of vital importance to poor and rich alike and Automobiles not of vital importance to either, but essentially a rich man's game, there has been so much fuss the law will probably be changed to the old tariff.

Handbills, programmes and printed advertising matter are raised from 20 per cent. ad valorem to 3 pence per pound. Cash Registers are advanced to 20 per cent. in place of 10 per cent. as before.

Hydraulic Cranes, which were free, are now 20 per cent. Iron Pipes over 5 in. diameter are raised to 20 per cent., former rate being 5 per cent. Locomotives, formerly free, are now classified as Steam engines at 20 per cent.

And so it goes on. There is a general advance all along the line.

The preferential schedules in favor of Great Britain are largely extended, but the percentage remains as before. This preference is fairly drawn out. It not only applies to any country forming part of the British dominions, reducing or abolishing or proposing to do so, the duty on any product of New Zealand, but also applies to any country, whether British or not. The only difference is that the Governor is absolutely authorized to make negotiations in the case of British dominions, but with other countries he can only do so subject to or by virtue of a treaty with the British crown. In both cases Parliament must ratify.

It is reciprocity fair enough. No treaty will be entered into, even with a British colony, unless a *quid pro quo* be given.

Any country desiring to play tit for tat with New Zealand can do so. Her preferential tariff policy is a simple one. For instance, if a country charges duty on wool or any other New Zealand product, the New Zealand Government sees no reason why that country's productions should not be taxed to an equal amount, when imported within its boundaries.

Food at Cost Price.

The dignity of labor appeals to all sound thinking men, but here is an example of the silliness of it.

The conference of trades and labor councils, sitting in Wellington, carried this resolution:

> That whereas all financial benefits accruing from labor legislation in the past have been nullified by the action of the capitalist class in raising prices out of proportion to the increase in wages, and whereas the reason for this lies in the uncurbed power of the capitalists, this conference strongly urges the people of New Zealand to make a stand, and demand legislation that will initiate a system of producing the necessaries of life and of supplying them to the people at cost price.

This New Zealand ideal would hardly appeal to our business men and the great American trusts, who are not engaged in the business of selling the "necessaries of life" at cost price.

An American Traveler's Experience with the Income Tax.

An American traveler the day before his departure from Melbourne met at one of the Melbourne clubs a gentleman who had recently been in New Zealand for business, and when he found out the American was going there, and above all things taking a big collection of samples, he told him such a tale of woe about the red tape, trouble and expense in connection with the Income Tax law, experienced traveler that he was, our American was perturbed, but he went to New Zealand all the same.

Briefly, the law is this: Any nonresident commercial traveler entering New Zealand must obtain a license to do business, for which the usual fee is a deposit of £10 sterling, as a guarantee that he will truthfully declare the profits made on the orders taken in the Dominion. On such profits a tax of 5 per cent. is levied. Upon arrival at the first port, which in this case was Dunedin, the American went to the Custom House, deposited £10, obtained his license and went about his business. There was no trouble about that.

After finishing his work in Dunedin he proceeded to Wellington. As this latter place is the seat of government, a few days before he was ready to leave he called upon the income tax collector, whom he found to be a polite and reasonable gentleman. The traveler explained it was quite impossible for him to declare profits, as he rarely obtained any actual orders, the firms he called upon merely inspected his samples and made notes of such articles as they would probably order when sending out their regular American indents or orders. The collector said he would consider the matter, and asked the traveler to return in a day or two.

Upon his return the collector said that no doubt his efforts would serve to increase trade in New Zealand for his principals, but as the actual increase could not be ascertained he had arrived at the conclusion that the fairest way would be for the Government to retain one-half of the deposit and return the other half, an arrangement to which the traveler at once assented, and without any delay or red tape there and then received the money.

Now note the difference. The man at the club in Melbourne was a Yorkshireman and inclined to be pugnacious. He thought he could tell the New Zealand Government what to do, and started in to make the trouble himself, with the result that the Government not only gave him plenty of it, but made his deposit £20, all of which was retained. Politeness always counts, but especially when dealing with Government officials.

The Business Men of Australia and New Zealand

are more like ourselves than any other men of affairs in the world. Many of them are self-made and none of them put on airs. The head of a firm is always approachable unless engaged, and this without the circumlocution of any formal introduction, which in many cases is so necessary in England. The Australasian possesses that excellent faculty of knowing he does not know everything. He is eager to find out what he does not know, hence commercial travelers representing lines of interest to him are always welcomed. Appointments to inspect samples are kept. Time is not wasted in superfluous talk. Business is the object in view and is strictly attended to. They do not rush about the way we do, but in other respects we are alike.

Prosperity reigns throughout Australasia, notwithstanding its tariff and labor laws. The country without any protective laws at all has abundant protection in Dame Nature, who gives this wonderfully productive part of the world a golden fleece in which gold and wool form a large part.

JOHN LUCAS & Co., Philadelphia, who have for the past 12 years maintained a sales branch in Chicago, have purchased a plant at Sixteenth and Morgan streets for the manufacture of Paints. This step is the outgrowth of an extensive development of the company's Western business and will materially add to the facilities of the Chicago branch. The recently acquired plant is being remodeled and the necessary machinery installed. The business will be continued as heretofore under the management of R. S. Lucas, and the railroad sales department will be in charge of Harry C. Quest, who formerly represented the Heath & Milligan Mfg. Company in a like capacity, with offices at 708 Marquette Building.

A Large Silverware Contract.

WHAT is probably one of the largest silverware contracts ever given out has just been awarded to the Meriden Britannia Company (International Silver Company), Meriden, Conn. The contract covers all of the silverware that will be used by the various railroads and steamships, as well as hotels and restaurants, comprising the so-called "Harriman lines," as follows: Union Pacific Railroad Company, Oregon Short Line Railroad Company, Oregon Railroad & Navigation Company, Southern Pacific Railroad Company, Northwestern Pacific Railroad Company, Illinois Central Railroad Company, Southern Pacific Company's Atlantic Steamship lines, as well as probably the Pacific Mail Steamship Company. In addition to the ware to be furnished for new equipment, there is also a great deal that will have to be supplied to take the place of that now in use, which must gradually be replaced to conform to standard designs. Following out W. V. S. Thorne's plan as director of purchases, the Harriman lines have adopted a standard style or design in silverware, which they will use throughout their system, and the arrangements as now made will run for a number of years. This contract, which the Meriden Britannia Company has been successful in securing in competition with other makers, shows the high standard attained by goods produced by this company, as conditions attending silverware for dining car, hotel or restaurant use are the most severe possible.

Clever Retail Advertising.

W. A. GUENTHER & SONS, Owensboro, Ky., recently had one of their plate glass windows broken by thieves, who got away with four Pistols worth about $30. Knowing that there was no use crying over spilt milk, the firm immediately proceeded to fill the window with Smith & Wesson, Colt and other high priced Guns. With these was shown the stone which broke the window marked:

"THIS IS THE ROCK THAT GOT FOUR GUNS LAST NIGHT."

On another card partially covered with silver dollars was printed:

"THESE ARE THE ROCKS THAT IT WILL TAKE TO GET EVEN ONE GUN HEREAFTER.

SIGNED, W. A. GUENTHER & SONS."

The window attracted so much attention that probably several thousand people came to view the broken glass and laugh at the joke, the result being that the firm turned their misfortune into an advertisement, which helped to recoup at least a portion of their loss.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM CURRIER LUMBER CORPORATION, Glamorgan, Va., which has recently incorporated and has opened up a new and up to date machine shop and two general stores handling General Hardware, Mill Supplies, Machinery, &c.

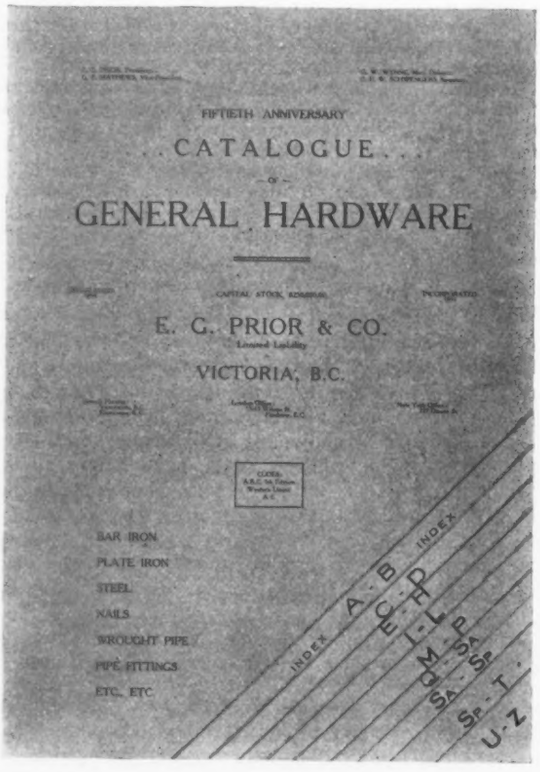
FROM TORNBLAD & PEDERSON, Kenyon, Minn., whose Hardware, Stove, Paint and Sporting Goods store has been destroyed by fire.

FROM ELLINGBOE HARDWARE COMPANY, Milaca, Minn., which has been incorporated with a capital of $50,000 by T. W. Caley, E. K. Evens and K. Ellingboe.

AT a meeting of the Board of Directors of the Merchants' and Traders' Association of Philadelphia, held April 23, F. W. Haff of the Supplee Hardware Company, who is widely known and honored in the Hardware trade, was elected president. Other officers chosen were: J. H. Cummings, first vice-president; G. L. Mitchell, second vice president; M. Dannenbaum, treasurer. The association is engaged in advancing the commercial interests of Philadelphia in the dissemination of a knowledge of its resources, its manufacturing and industrial advantages and its importance as a distributing point.

A British Columbia Catalogue.

E. G. PRIOR & CO., Victoria, B. C., claim the distinction of issuing the first large general Hardware catalogue published in the province of British Columbia. They have lately completed and are now distributing to the trade a volume of over 650 pages, 8 x 11 in. in size and containing some 3500 illustrations, covering a complete line of Hardware and kindred goods which are in demand in that section of the country. A noteworthy feature of the book is its complete and convenient index, which itself is alphabetically indexed by the novel method shown in the accompanying illustration. We are advised that a considerable staff, under the direction of Theodore Korb, has been engaged for about a year in getting out this catalogue, and that the better part of one of the largest printing plants in Victoria was occupied for a



Unique Index of British Columbia Catalogue.

like period on the printing and binding. The firm of E. G. Prior & Co. was established in 1859 and the new publication is appropriately styled their fiftieth anniversary catalogue. Not many business houses in British Columbia have reached the half century mark, and this house is among the pioneers who have proved and profited by their confidence in the future of that province.

THE TERRE HAUTE FURNACE & SHEET METAL COMPANY, Terre Haute, Ind., recently incorporated with a capital stock of $10,000, has taken over the stock and business of the Terre Haute Stove & Furniture Company. The new corporation consists largely of the stockholders of the latter company. As a result of the reorganization the sale of Stoves has been discontinued and the new company will give its entire attention to steam and hot water heating and the manufacture of Galvanized and Copper Cornices and general sheet metal work. The officers of the company are Herbert Briggs, president; T. F. O'Herron, secretary and superintendent; Thomas G. Love, vice-president; S. C. Brown, treasurer and manager.

AMONG THE HARDWARE TRADE.

S. I. Posson & Co., Altus, Ark., Hardware merchants, are putting in a branch store at Ozark, Ark.

H. D. Meek, Centre Hall, Pa., has purchased the business formerly conducted by the College Hardware Company. The entire interior of the store will be remodeled and a new stock purchased.

Walton Bros. & Montfort have purchased the Hardware portion of Harry Litton's stock of goods in Blaine, Wash.

H. G. Kroncke Hardware Company, Madison, Wis., has been incorporated with a capital of $37,000 to deal in Shelf Hardware, Stoves, Tools, &c.

The Hardware store of James Murrison, Balaton, Minn., has been destroyed with a loss of about $6000, partially covered by insurance.

The Boyes-Beck Hardware Company, Ltd., has succeeded Boyes Hardware Company, Caldwell, Idaho, handling Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils and Sporting Goods. The new company is incorporated with a capital stock of $10,000. The incorporators are Fred. C. Boyes, George Beck and E. H. Plowhead.

Fred L. Schroeder has purchased the Hardware department of the Metz Mercantile Company, Kiowa, Kan.

The Crescent Hardware Company has purchased the business of the Wakefield Hardware Company, in Greensboro, N. C., and will continue the business at 229 South Elm street. The company is incorporated with $50,000 capital stock, $14,000 being paid in.

The Belle Plaine Implement Company has succeeded J. H. Butts & Son, Belle Plaine, Kan., whose stock was recently damaged by fire.

Elvie W. Adt, Torrington, Conn., has purchased the Hardware store of James J. Dwan of that place, and will continue the business. Mr. Adt was formerly with W. V. Barber.

S. J. Metcalf & Sons, Oneida, Ill., are successors to Metcalf Brothers, Hardware merchants and manufacturers of Harness. A. D. Metcalf, the senior partner of the old firm, is retiring from active business, having disposed of his interest in the business to his two sons.

J. L. Keny of the Hardware firm of Keny & Cox, Maryville, Tenn., has bought the interest of J. L. Cox, and will in future conduct the business under his own name.

The Hibner-Hoover Hardware Company has purchased the business of Frank W. Prothero, in Du Bois, Pa. The company will handle Hardware, Stoves, Doors, Sash, Cutlery, Paints, Oils, Buggies, Wagons, Harness, &c.

D. B. Robertson has opened a store at Silver City, N. M., and handles Shelf Hardware, Stoves, Tinware, Agricultural Implements, Paints and Sporting Goods. Heavy Hardware will be added to the stock later.

D. P. Hayes has succeeded W. F. Pool as manager of the John Smith Hardware Company, Waitsburg, Wash. The company handles Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Paints. Attention is also given to plumbing and tinning.

W. A. Henry & Co., formerly with M. C. Warren & Co., 9 Dock square, Boston, have opened a new Hardware store at 7 Union street, in the same neighborhood.

The Shipley Hardware Company, Meyersdale, Pa., which was formerly a partnership, has been incorporated with an authorized capital stock of $75.000 as the Shipley Hardware Company, Inc., and will conduct both a wholesale and retail business. The directors elected are J. T. Shipley, B. E. Shipley, J. Milton Gnagey, E. J. Weld and S. B. Philson, J. T. Shipley being president; B. E. Shipley, treasurer, and J. Milton Gnagey, secretary.

Death of Stephen D. Neal.

STEPHEN D. NEAL, Southington, Conn., the only surviving son of Roswell A. Neal, so long and favorably known to the Hardware trade as the president of the Peck, Stow & Wilcox Company, died at his home on April 21. Mr. Neal was born January 1, 1861. He was educated at the public schools of his home town, graduated at the Lewis Academy and afterward at the Connecticut Literary Institute at Suffield, Conn. In his young manhood, while his father was alive, he was for a short time secretary of the Peck, Stow & Wilcox Company. After the death of his father he became general manager of the Ætna Nut Company at Southington, which place he retained until the time of his decease. He was married in 1884 to Miss Grace Selden, a sister of Mrs. Armour of Chicago.

Mr. Neal was one of the prominent citizens of Southington, and until within the last few months had been considered in the most robust health. He had held many local political offices, was warden of the borough and very popular in the association known as Red Men, and at the time of his death was the State Great Prophet, having previously held all the offices, including that of Great Sachem. He was a member of the Masonic fraternity, Knights of Pythias and other organizations. A wife, a son and a sister survive him. The funeral ceremonies were held on Friday, 24th inst., at the First Baptist Church in Southington.

Rural Free Delivery Mail Box.

The accompanying illustrations show a rural free delivery mail box, open and closed, offered by the Beaver Mfg. Company, Beaver, Pa. The box has been approved

Fig. 1.—Interior of Rural Free Delivery Mail Box.

by the Post Office Department. It is of galvanized steel, 18 in. long, 7 in. wide, 9 in. deep in the rear and 5 in. deep in front, and is guaranteed to be weather proof, all joints being both seamed and soldered. The box con-

Fig. 2.—Rural Free Delivery Mail Box.

tains a letter holder and change tray on the inside, as shown in Fig. 2, so as to avoid the necessity of fumbling around on the bottom of the box when the fingers are

cold trying to pick up change or letters. The letter slot is placed in such a manner as to be thoroughly protected from the weather, and yet is always open for the admission of mail without having to raise any flap. It is pointed out that the signal cannot possibly be tampered with by mischievous persons, it being controlled by the lid of the box, and cannot be raised or lowered without opening the lid. When this is done the signal falls to its place without being touched by the hand. The locks are referred to as being of the best combination master keyed grade, no two alike, each lock being provided with two keys for the owner's use, a master key being also supplied for the carrier's use. Lock is furnished with chain to attach to box, or without chain, as desired. The boxes are finished with aluminum bronze.

The Toscot Flat Flexible Metallic Belt Coupling.

The Toscot flat flexible metallic belt coupling, manufactured by the Tostevin & Cottie Mfg. Company, 635 Kent avenue, Brooklyn, N. Y., and on which a patent is

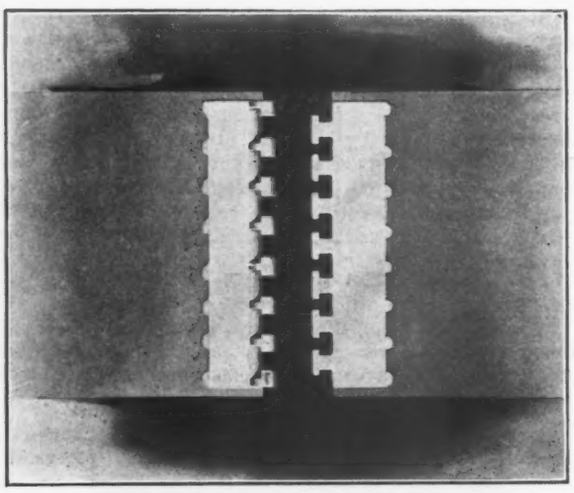


Fig. 1.—Outside View of the Toscot Flat Flexible Metallic Belt Coupling, Showing the Two Parts Before Hooking.

pending, is illustrated herewith. Fig. 1 gives an outside view of the coupling applied to belt, and shows the two parts of the device before hooking, while Fig. 2 presents a view of the inside of the coupling and belt after hooking. The special feature of this coupling is its flex-

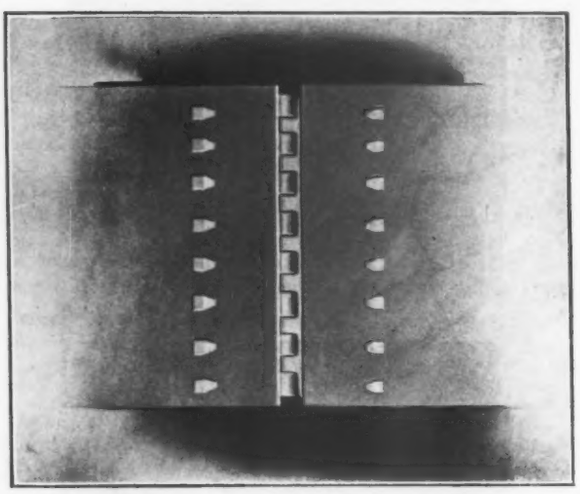


Fig. 2.—View of the Inside of Belt and Coupling After Hooking.

ibility at the point where the ends of the belt meet, the construction permitting the coupling to set close to the surface of the pulley so that there is no strain on the edges of the coupling, causing the belt to crack. Among other points made in behalf of the coupling are that it is easy to attach, will not tear out and that the belt may be taken apart readily at any time. The couplings may be used on the smallest size of pulleys, as well as on the heaviest machinery and power transmission. The couplings are drawn from cold rolled sheet steel and are manufactured in all standard belt sizes. They are made slightly shorter than the width of the belt for which they are used, which is considered an advantage.

Glass Board and Sundry Cabinet.

W. C. Heller & Co., Montpelier, Ohio, manufacturers of steel shelf boxes, &c., have added to their line the cabinet with glass board lop, front and rear of which are shown

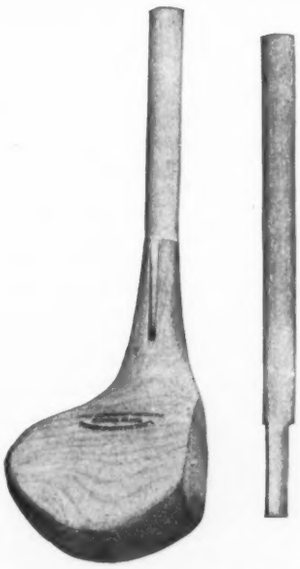
Fig. 1.—Glass Board and Sundry Cabinet, Front View.

in the accompanying illustrations. The board is strongly made of well seasoned lumber and, it is said, will always remain true. It is ruled both ways in inches, with steel rule on front end graduated in inches and eighths, and can be instantly adjusted to cut glass of any size. The straight edge or rule is adjustable, being fitted at each end with adjustable gauges connected by a rod so as to move simultaneously equal distances. As it is impossible to move one end more than the other, an absolutely straight line is secured. The rule has a wedged point at the top end and a lug at the bottom and readily fits into 1 in. spaces provided at the top and bottom of the board and at any point desired. For cutting even inches the

Fig. 2.—Glass Board and Cabinet, Back View.

connecting rod is turned back as far as it will go and secured there by a set screw. It is then dropped into the 1-in. space at the top and bottom of the board and is thus firmly held in place and ready for the cutter. The rule is fitted with a very simple device by which it can be moved forward and backward and set for cutting fractions of an inch. When several lights of glass of the same size are to be cut, after the screw is once set every light will be of exact size. The long drawer at the top under the board may be used for the rule, glass cutters, points, &c., and the other drawers are just the right size for one and three-quarters reams of sandpaper. The large movable box setting under the long drawer is paneled to match the ends of the cabinet and is fitted with roller bearing casters. It is used for cuttings or broken glass, sweepings, &c. The back of the cabinet (Fig. 2) contains 15 large drawers, each holding 25 lb. or more of dry colors or other goods. It has a solid oak exposure finely paneled, fitted with strong handles and card frames and finished in antique finish.

Lee & Underhill Patent Socket Golf Clubs.

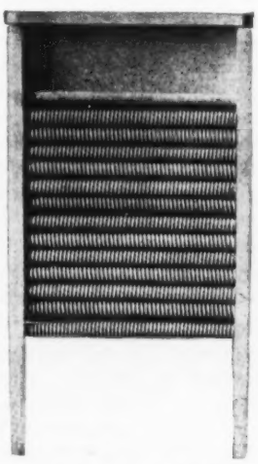


Patent Socket Golf Club, Unwrapped at Joint, with End of Shaft Before Insertion in Head.

Lee & Underhill, 98 Chambers street, New York, are now putting on the market, made in their own works, on the premises, the Lee & Underhill patent socket Golf Club, here shown. The intent of this form of construction is to assure in the event of fracture of the shaft, the insertion of a new one without difficulty and yet obtain the same "lie" of the head. This is accomplished by drilling the head and slotting it lengthwise or parallel with the direction of the shaft, when made originally. The end of the shaft entering the socket is also prepared in shape so that when necessary to remove the portion remaining in the socket, it can be readily withdrawn after steaming over a kettle to soften the glue, after the wrappings have been removed and without reboring the hole or altering the direction of it. The heads are made of persimmon wood, the shafts of hickory and the grips are of a specially prepared horsehide.

Roller Bearing Washboard.

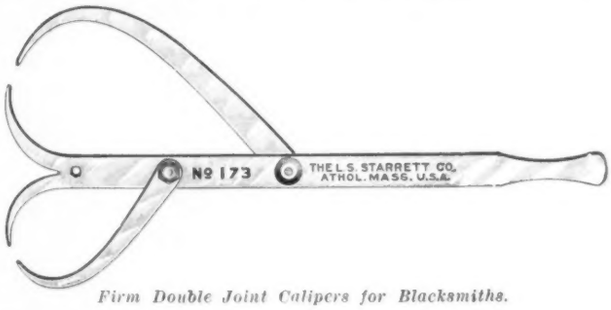
The Abingdon Mfg. Company, Abingdon, Ill., is offering a washboard known as Hubbards' roller bearing washboard, which is somewhat of a departure from the usual types with which the trade is familiar. The board is constructed of a series of cylinders, eleven in number, mounted in the frame on steel pins. Each of the cylinders is corrugated with running screw threads, which are cut alternately right and left, making 52 corrugations or threads on each roller. The effect of this arrangement is to produce a side rubbing motion on both downward and upward stroke by the opposing tendency of the rollers. It is claimed that the additional friction thus brought to bear upon the clothes quickens the process of cleansing and lessens the labor necessary to accomplish the result. The board has no back, and the dirty water passing freely between the rollers finds no lodgment back of the rubbing surface. It is said to be of durable construction and easy on both hands and clothes.



Roller Bearing Washboard.

Double Joint Blacksmith's Calipers.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, is manufacturing the firm double joint calipers for blacksmiths, No. 173, here illustrated. It is 22 in. long, over all, one caliper having a capacity of 6 in. and the other 12 in. The difference in length of arms serves to prevent confusion in use where there are but slight variations in diameters and a marked advantage is the fact that with this tool both rough and finished sizes can be determined comfortably and with less inconvenience than ordinarily, on either hot or cold forgings and with much saving in time.



Firm Double Joint Calipers for Blacksmiths.

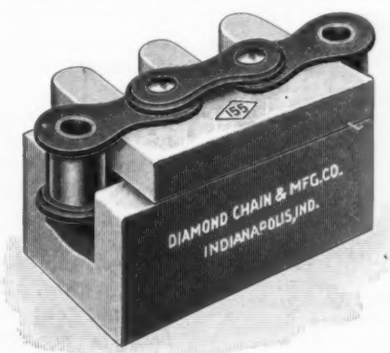
Small Package of Steel Wool.

Package of Steel Wool for Household Use, &c.

The American Steel Wool Mfg. Company, 451-453 Greenwich street, New York, has recently put on the market Steel Wool in small packages for convenient handling by the trade, as shown in the accompanying illustration. It takes the form of a pasteboard roll about 8 in. long and between 3 and 4 in. in diameter, neatly labeled and marked with the retail price, 10 cents. This product is especially recommended for many domestic uses, such as cleaning and polishing kitchen utensils, bathroom fixtures, floors, furniture, brass, iron and wooden ware, &c. Four grades are offered, ranging from No. 0, the finest, to No. 3. The company also makes a coarser product called Steel Shavings, which are recommended for cleaning and polishing hardwood floors and bowling alleys, for removing old paint, varnish, rust and grease and for general rough work.

The Diamond Chain Repair Block.

The accompanying illustration represents a roller chain repair block put on the market by Diamond Chain & Mfg. Company, Indianapolis, Ind. The tool is small enough to be carried in the pocket, and is alluded to as making the insertion of a new link a very small matter. The operation is described by the manufacturer as follows: By placing the chain in the block, as shown, and giving both rivet heads a light tap with a hammer and another with a center punch, the side bar may be lifted, the repair link inserted and the chain drive is in working order in less than 10 min. If it is desirable to use the old link again, it is only necessary to put the link and side bar back into place and flatten out the two rivet ends with the hammer. It is stated that with the use of the repair block the link can be changed without taking the chain off its sprockets.



The Diamond Chain Repair Block.

Wagner Hay Rack Fixtures.

The Wagner Mfg. Company, Waterloo, Iowa, has recently added to its line of hardware specialties the hay rack fixtures herewith illustrated. One of the chief objects aimed at in the production of the fixtures was to overcome the annoyance and damage occasioned by con-

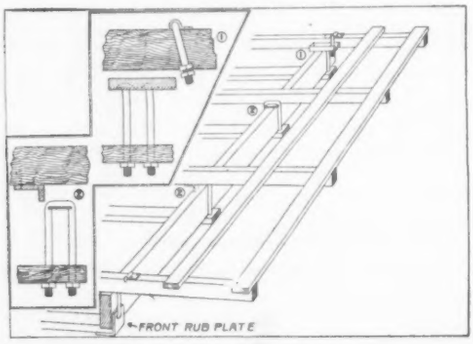


Fig. 1.—Wagner Hay Rack Fixtures.

tact of the front wheel with the front bottom cross piece of the rack. When the latter is unprotected it is subject to rapid wear, necessitating frequent renewal, and sometimes catches in the wheel, breaking out spokes. To guard against these results the fixtures include an iron rub plate fastened to and extending across the front end piece, to which attention in called in Fig. 1. Another feature contributing to convenience in handling the rack is found in the provision made for removal of the top.

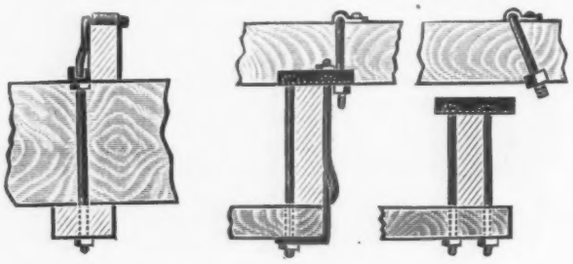


Fig. 2.—Suspension Bolts in Place.

This, as will be seen by reference to Figs. 2 and 3, is accomplished by simply loosening the nuts of the suspension bolts; this done, the parts are separated by swinging the bolt back out of the yoke slot and the detached top can be lifted off. This operation does not require the removal of the nuts, which need only be loosened and are therefore not liable to be misplaced and lost; they are also always ready and in position when it is desired to put the top on again. The separable arrangement of the top and bed of the rack not only facilitates its removal, of the bed for trucking but also permits the use purposes. It is suggested that in putting the rack together care should be taken to have the slotted angle pieces placed half on one side and half on the other, as indicated in Fig. 1, in order to prevent the rack slipping forward or backward. The holding nut on the swing bolts is secured by a jam nut to guard against its working loose. The fixtures are made in three sizes, No. 114 for 2 x 8 bed sills and 2 x 6 cross pieces, No. 116 for 2 x 8 bed sills and 2 x 6 cross pieces, No. 118 for 2 x 10 bed sills and 2 x 6 cross pieces, all of which are furnished with four swing bolts, one at each corner, using loops for the center. If it is desired to substitute the swing bolts for the center loops eight of the former will be furnished at slight additional cost. The average weight per dozen sets is about 175 lb.

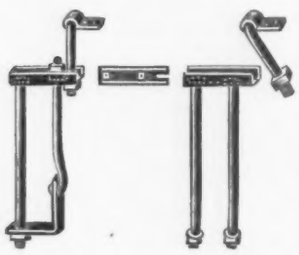
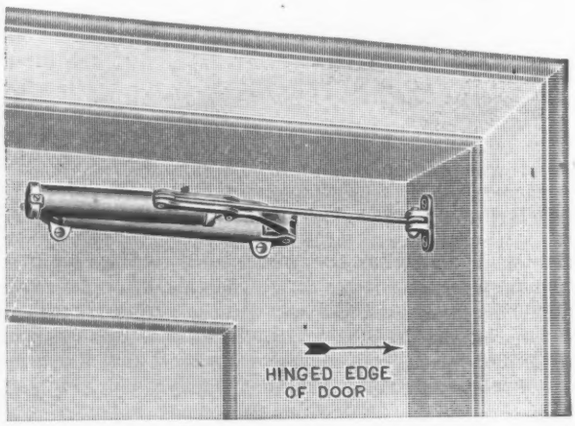


Fig. 3.—Detail of Suspension Bolts.

The Bardsley Air Check and Spring.

The spring and check here shown has been devised by Joseph Bardsley, 147-151 Baxter street, New York, for screen door purposes. It may be applied on the inside of the door and to either hand of door. It is at present made in two sizes, the smaller, No. 1 A, being suitable for screen doors of ordinary size, and requiring 3 in. of space, and the larger size, No. 2 A, being suitable for heavy screen doors or ordinary interior doors, and requiring 4 in. of space back of the door. The parts swing on pivots, and since the pull on the spring is central and direct there is a reasonable freedom from friction. The spring, which is of the round wire compression type and sufficient length to insure durability, is covered by the casing against the door, and its tension is regulated by means of a screw at the outer end. Should a spring break a new one can readily be put in. The plunger is

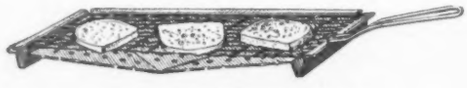


Bardsley Air Check and Spring.

a leather cup, which can also be easily replaced if necessary. The cylinder is brass and the two caps of pressed steel, the one at the outer end having a hinge joint formed on it at one side, and on the outer side a U-shaped spring through which passes the vent regulating screw holding the screw from shaking loose. The lever is of malleable iron, and the back casing of cast iron. To free the check so that the door can be removed, it is only necessary to lift the pin from the jamb bracket. The manufacturer states that samples of this device have been well tested on doors in actual use, and have proved their durability. It is neat in appearance, and being applied on the jamb side of the door is not conspicuous.

The Andrews Bread Toaster.

Among the hardware specialties manufactured by the Andrews Wire & Iron Works, Rockford, Ill., is the bread toaster shown in the accompanying illustration. It is designed to effect the uniform delivery of heat generated and at the same time keep the toast from direct contact with the fire. To secure this result the ends of the bot-



The Andrews Bread Toaster.

tom plate are dished upward from the center so as to spread the heat to the outside and evenly distribute it over the toasting surface. The flame is restrained from curling over the edges by the V-shaped feet which support the toaster. Funnel shaped holes are provided in the bottom plate for the passage of heat, but the perforations are too small to admit the passage of the flame. The bread rest, which is 9 in. square, is made of bright finished wire, the body of the toaster being constructed of planished steel with a turned wire handle. It is claimed that besides toasting quickly and evenly, the device is especially economical in the consumption of gas because it utilizes practically all of the heat generated.

Russwin Liquid Door Check.

The Russell & Erwin Mfg. Company, New Britain, Conn., has made a number of changes in its Russwin door check, the new model of which is illustrated herewith. Attention is particularly called to its neat and unobtrusive appearance. The working parts are of malleable iron and drop forged steel machined to a perfect fit, all parts being interchangeable in the same size of check. The coil wire spring, which is used in preference to a flat band spring, is said to have proved capable of meeting the demands of the most severe service. The liquid in

Russwin Liquid Door Check.

the check is a nonfreezing oil in which the main working parts are immersed, reducing friction to a minimum. By the use of gland and washers it is declared that the possibility of leakage has been eliminated. The gland is made in one piece and gives a long bearing to the spindle, preventing buckling of the spindle and consequent wearing on the ratchet and cover. There is but one piston, with short bearings on a long carriage. This gives a perfectly smooth and even action. The escape of the compressed liquid is through the valve and overflow chamber into the piston chamber, and there is, therefore, no great pressure on the gland and washer surrounding the spindle. For this reason it is also stated that the check will work equally well if the chamber is only half full of liquid. Expansion and contraction of the liquid have no effect on the working of the check. Ball and socket joints are used, and the arm will not bind. By means of a valve screw the checking power is easily adjustable. The check is easy of application, being applied to right or left hand doors without reversing either the arm or spring. This avoids labor and trouble and also the possibility of mistake in reassembling, with consequent damage to the check. Six sizes are offered for doors, ranging from screen and light inside doors to extra heavy outside doors and large doors operated against strong drafts.

High Lift Chain Elevator.

The Louden Machinery Company, Fairfield, Iowa, is making the high lift chain elevator shown in the accompanying illustration by which litter carriers or other receptacles may be raised or lowered as desired. The regular sized elevator is fitted with chains to raise or lower the receptacle 7 ft. If a greater range is desired chains of the proper length will be furnished at slight additional cost. The hoisting drums are provided with sprockets to fit the chains. Referring to the illustration, the pipe or hollow cylinder A is mounted upon the pipe which connects the trucks and is rotated thereon by means of the screw S. The chains are attached to the opposite ends of the cylinder A, and as the receptacle is elevated they are wound up so as to take up the slack, as indicated. Guides B B are used to insure the even winding of the chains on the cylinder, following back and forth as the chains are wound or unwound. With the elevator the company's overhead carrier is very convenient where material is to be lifted from one floor to

High Lift Chain Elevator.

another in the same building and carried to some remote part of the floor. It will also be found efficient for use in stone quarries, deep ditches and other places where it is necessary to handle heavy material, lifting the load quite a distance and then carrying it to one side for loading or dumping.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	℔ gal.
Linseed, State and Western, raw, in bbls.	40 @42
City, Boiled, in bbls.	43 @44
City, Raw, in bbls.	42 @43
Raw, Calcutta, in bbls.	70 @..
Lard, Prime, Winter	66 @70
Extra No. 1	55 @57
No. 1	47 @52
Cotton-seed, Crude, f.o.b. mill	34 @35
Summer Yellow, prime	42¾@43¼
Summer White	45 @46
Yellow Winter	45 @45½
Tallow, Acidless	52 @55
Menhaden, Brown, Strained	40 @..
Light Strained	40 @..
Cocoanut, Ceylon	℔ lb 6¼@6½
Cochin	℔ lb 8 @8¼
Cod, Domestic, Prime	42 @44
Newfoundland	44 @46
Red, Elaine	38 @40
Saponified	℔ lb 5¾@..
Olive, Yellow	67 @69
Neatsfoot, Prime	55 @58
Palm, Lagos	℔ lb 5⅝@5¾

Mineral Oils—

	℔ gal.
Black, 29 gravity, 25@30 cold test	13 @13½
29 gravity, 15 cold test	13½@14
Summer	12½@13
Cylinder, light filtered	20½@21
Dark, filtered	18 @19
Paraffine, 903-907 sp. gravity	14½@15
903 sp. gravity	13½@14
883 sp. gravity	11 @11½
Red	13½@14

Miscellaneous—

Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer. floated	℔ ton 19.00@20.00
Off color	℔ ton 13.00@16.50
Chalk, in bulk	℔ ton 3.00@3.40
China Clay, Imported	℔ ton 11.50@18.00
Cobalt, Oxide	℔ 100 lb 1.45@2.60
Whiting, Commercial	℔ 100 lb .42@.52
Gilders	℔ 100 lb .55@.60
Ex. Gilders	℔ 100 lb .60@.65

Putty, Commercial—℔ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.45
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—℔ gal.

In Oil bbls.	46½@47
In machine bbls.	47 @47½

Glue—

	℔ lb
Cabinet	12 @15
Common Bone	7½@9
Extra White	18 @24
Fish, liquid, 50 gal. bbls., per gallon	60 @1.20
Foot Stock, White	12 @14
Foot Stock, Brown	9 @11
German Common Hide	10 @12
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	10 @12
Medium White	14 @17

Gum Shellac—

	℔ lb
Bleached, Commercial	@20
Bone Dry	@25
Button	30 @40
Diamond I.	47 @48
Fine Orange	29 @32
A. C. Garnet	23 @24
G. A. L.	18 @19
Kala Button	17 @18
D. C.	48 @49
Octagon B.	38 @40
T. N.	22 @23
V. S. O.	47 @48

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	10½@10⅝
Lead, American White:	
Lots of 500 lb or over, in Oil	@6¾
Lots less than 500 lb, in Oil	@7¼
Lead, White, in oil, 25 lb tin pails	@7¼
Lead, White, in oil, 12½ lb tin pails	@7¾
Lead, White, in oil, 1 to 5 lb assorted tins	@8¾

Lead, American. Terms: On lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice.

Zinc, Dry—

	℔ lb
American, dry	5¼@5⅝
Red Seal (French process)	6⅜@7
Green Seal (French process)	7¼@7½
German Red Seal (French process)	6⅝@7
Green Seal	7¼@7⅝
White Seal	7⅝@8¼
French, Red Seal	8¼@8¾
Green Seal	10½@10¾

Dry Colors—

	℔ lb
Black, Carbon	6½@10
Black Drop, American	3½@8
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, commercial	4 @6
Blue, Celestial	4 @6
Blue, Chinese	31 @33
Blue, Prussian	29 @31
Blue, Ultramarine	3½@15
Brown, Spanish	½@1
Carmine, No. 40	$3.10@3.25
Green, Chrome, ordinary	3½@5
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls., kegs.	@6¾
Litharge, bbls., ½ bbls., kegs.	@6¾
Ocher, American	℔ ton $8.50@16.00
American Golden	2½@3¼
French	1¼@2
Foreign Golden	3 @4
Orange Mineral, English	10 @11
French	12¾@13
German	10 @11
American	8½@8¾
Red, Indian, English	4½@6
American	3 @3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
English	℔ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	3 @9
Italian, Raw, Powdered	3 @7
American, Raw	1½@2
American Burnt and Pow'd.	1½@2
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .90@1.00
English	℔ 100 lb .80@1.00
American	℔ 100 lb, No. 1. .75@.80
American	℔ 100 lb, No. 2. .60@.85
Umber, T'key, Bnt. & Pow.	2¾@3
Turkey, Raw and Powdered	2¾@3
Burnt, American	1½@2
Raw, American	1½@2
Yellow Chrome, Pure	13 @15
Vermilion, American Lead	7 @25
Quicksilver, bulk	65 @..
Quicksilver, bags	@66
English, Imported	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent....35%
Taplin's Perfection....35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs ....$2.00@$3.00

Anvils—American—

Eagle Anvils....℔ lb @8¼¢
Hay-Budden, Wrought....9¼@9¾¢
Trenton ....℔ lb 9½@9¾¢

Imported—

Swedish Solid Steel Sisco, Superior, ℔ lb....10¢@10½¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co....10%

Augers and Bits—

Com. Double Spur....75&10@80%
Jennings' Patn., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers....70%
Car Bits, 12-in. twist....40&10%
Ford's Auger and Car Bits....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list....50%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits....15%
Mayhew's Countersink Bits....45%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....60%
Snell's Car Bits, 12-in. twist....60%
Snell's King Auger Bits....50%
Wright's Jennings' Bits....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's Pattern, No. 1, ℔ doz., $26; No. 2, $18....60&10%
Ford's, Clark's Pattern....66⅔&5%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00....60&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dbl. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$6.50@7.00
Ames ....25&10%
Universal 20%

Ship Augers and Bits—

Ship Augers....40&10@—%
Ford's ....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ....33⅓&7½%
Snell's 48%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled ....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@$1¼
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket.gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality....$4.75@5.00
Second Quality....$4.25@4.50
Double Bit, base weights:
First Quality....$7.00@7.50
Second Quality....$6.50@6.75

Axle Grease—

See *Grease, Axle.*

Axles—Iron or Steel.

Concord, Loose Collar..4½@5 ¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¾@4¼¢
No. 1½ Com., New Style..4½@5 ¢
No. 2 Solid Collar....4½@5 ¢
Half Patent:
Nos. 7, 8, 11 and 12..65@65&10%
Nos. 13 to 14....65@65&10%
Nos. 15 to 18....70@70&10%
Nos. 19 to 22....70@70&10%

Boxes, Axles—

Common and Concord, not turned ....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent....lb., 9½@10¢

Bait—Fishing—

Hendryx:
A Bait....20%
B Bait....25%
Competitor Bait....20&5%

Balances—Sash—

Caldwell new list....50%
Pullman ....50&10%

Spring—

Spring Balances....50&10@60%
Chatilon's:
Light Spg. Balances....50@50&10%
Straight Balances....40@40&10%
Circular Balances....50&10%
Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., —@2½@2¾¢

Towel—

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beam, Scale—

Scale Beams....40%
Chattillon's No. 1....30%
Chatillon's No. 2....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned....℔ doz, $1.50

Beaters Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd. $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover....$6.50

Bellows—

Blacksmith, Standard List:
Split Leather....60&10@65%
Grain Leather....50@50&10%

Hand— *Net Prices.*

Inch..	6	7	8	9	10
Doz..	$5.00	5.50	6.00	6.50	7.50

Molders—

Inch..	10	12	14	16
Doz..	$7.50	9.00	12.00	15.00

Bells—Cow—

Ordinary Goods...75&5@75&10&5%
High grade....70&10@75%
Jersey ....75&10%
Texas Star....50%

Door—

Home, R. & E. Mfg. Co.'s....55&10%

Hand—

Polished, Brass....50&10@60%
White Metal....50&10@50&10&5%
Nickel Plated....50&5%
Swiss ....50&5%
Cone's Globe Hand Bells....33⅓@35%

Miscellaneous—

Farm Bells....lb., 2¼@2½¢
Church and School....65@65&5%

Belting—Leather—

Standard ....70&10@70&10&5%
Light ....75&10%
Cut Leather Lacing...50&10@60%
Leather Lacing Sides, per sq. ft. 21@22¢

Rubber—

Competition (Low Grade), 70&10@75&5%
Standard ....60@60&10%
Best Grades....33⅓@40&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list: Chain, Parts, Spokes....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks Tackle—

Common Wooden....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined....55%
Embossed 55%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co....33⅓%

Bolts Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜ x 6 and smaller..75&5@—%
Larger and longer....70@—%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends....70@—%
Machine (Cut Thread):
⅜ x 4 and smaller..75&10@—%
Larger and longer....70@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:

Inch	3	4	5	6	8
Per doz..	$0.30	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:

Inch	6	8	10
Per doz.	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz.	$1.00	1.40	1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:

Inch	6	8	10
Per doz.	$0.75	.95	1.25

Wrought Barrel Jap'd..80@80&10%
Barrel Bronzed....60&10%
Spring ....70&10@70&10&10%
Shutter ....50&5@50&10&5%
Square Neck....75@75&10%
Square ....70&10@10%
Ives' Patent Door....55%
Ives' Wrought Metal....45%

Expansion—

Richards Mfg. Co....55&10%
Steward & Romain Mfg. Co.:
Style No. 13, Double....55%
Style No. 1, Single....55%
Style No. 100, Dbl. Jaw, Single...50%
Lag Screw....66⅔%

Plow and Stove—

Plow ....65&5@70%
Stove ....85@85&5%

Tire—

Common Iron....80%
Norway Iron....80%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28 '99....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec, 28, '99....80%
Norway Phila., list Oct. '84....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99....80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz...	$4.80	5.60	6.40	8.00
Inch.....	2¼	2½		
Per doz.....	$8.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each....25%

Boxes, Mitre—

C. E. Jennings & Co....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ....15&10%
Perfection 40%
Seavey 45%

Braces—

Comman Ball, American....$1.50
Barber's ....50&10&10@60&10%
Fray's Genuine Spofford's....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ....60%
C. E. Jennings & Co....50&5%
Mayhew's Ratchet....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—

Wrought Steel....70&10@75&10%
Bradley Metal Clasp...80&10@80&10&5%
Griffin's Pressed Steel....75@75&10%
Griffin's Folding Brackets....70&10%
Taplin Victor Handy Egg Beater Bracket ....℔ doz. $1.50

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co....75&20%
Wire Goods Co....75%

Buckets, Galvanized—

M'fr's list, price per gross.

	Quart..	10	12	14	
Water, Reg...	25.35	28.00	32.00		10&5&5%
Water, Hvy...	45.35	48.00	52.00		
Fire, Rd. Btm.	32.00	34.65	38.65		
Well	37.35	41.35	45.35		

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought, High List, Oct. 26,'06.55%
Cast Brass, Tiebout's....40%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint....70&10@75%
Loose Pin....70&10@75%
Mayer's Hinges....70@70&5%
Parliament Butts....70@70&5%

Wrought Steel—

Bright.
Light Narrow, Light Reversible ....70&5%
Reversible and Broad..70&5%
Loose Joint, Narrow, Light Inside Blind, &c....70%
Back Flaps, Table Chest..65% Japanned.
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip..60%
Broad ....40&5%
Steeple Tipped....70%
Ball Tipped....70%

Extra 10%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per lb., 4¼@4¾¢
Sharp, 1 prong, per lb., 4¾@5¼¢
Burke's, Blunt, 4@4¾¢; Sharp, 4½@5¼¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B......52@55¢
G. D......*per M* 34@35¢
F. L......*per M* 40@42¢
G. E......*per M* 48@50¢
Musket.....*per M* 62@63¢

Primers—

Berdan Primers, $2 per M..2%&5%
Primer Shells and Bullets..15&10%
All other primers per M.$1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:

32 C. F.,						10&5%
38 C. F.,						10&5%
22 cal. Rim,						10&5%
32 cal. Rim,						10&5%
B. B. Caps, Con. Bull, Swgd.						$1.90
B. B. Caps, Round Ball.						$1.40
Central Fire						25%
Target and Sporting Rifle						15&5%
Primed Shells and Bullets						15&10%
Rim Fire, Sporting						50%
Rim Fire, Military						15&5%

Casters—

Bed.....65&10%
Plate.....60&5%
Philadelphia.....70&10%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem..... 20%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list...40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	⅝
$8.15	5.55	4.60	3.95	3.75	3.65	3.55

¾-⅞-1 1⅛ to 1¼ inch.
$3.45 3.55
In cask lots, deduct 25¢.
German Coil.....60@60&5%
German Pattern Coil:
6-0 to 1.....70&5@70&10%
2 and 3..60&10¢10@60&10¢10&5%
4, 5 and 6.....50&10@50&10&5%

Halter—

Halter Chains.....60@60&5%
German Pattern Halter Chains, list July 24, '97.....60&10&5%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring..$28.00
6½—6-2, Straight, with ring..$29.00
6½—8-2, Straight, with ring..$32.00
6½—10-2, Str'ght, with ring..$37.00
NOTE.—Add 2¢ per pair for Hooks. Twist Traces: add per pair for Nos. 2 and 3, 2¢; No. 1, 3¢; No. 0, 4¢ to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c...60&10@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10&7½%
Brass.....65%
Safety and Plumbers' Chain..75%
Gal. Pump Chain....*lb.*, 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil.35&2½@40%
Triumph Dog..... 50&10@60%
Brown Halter and Coil....45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@10%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk— (From Jobbers.)

Carpenters' Blue.....*gro.*, 50@55¢
Carpenters' Red.....*gro.*, 45&50¢
Carpenters' White...*gro.*, 40@45¢

Checks, Door—

Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....50%
Youths' Chests, with Tools.....35%
Gentlemen's Chests, with Tools..25%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

Standard List.....80&10@—%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White & Co.....30@30&5%

Tanged—

Tanged Firmers.....30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co..... 25&5%

Cold—

lb.
Cold Chisels, good quality..13&15¢
Cold Chisels, fair quality..11&12¢
Cold Chisels, ordinary.... 9@10¢

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat, each $8.00..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Patent Chucks:
Independent Lathe Chucks.....35%
Universal, Reversible Jaws.....35%
Combination, Reversible Jaws....35%
Drill Chucks, New Model, 25%; Standard, 45%; Skinner Pat., 25%; Positive Drive..... 40%
Planer Chucks..... 20%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved.....50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—

Adjustable Hammers.....20@20&5%
Carriage Makers', P., S. & W. Co. ..... 50&10%
Besly, Parallel..... 33⅓&10%
Myers' Hay Rack..... 45%
Lineman's Swedish Neverturn..... 65%
Wood Workers' Hammers.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary..... 40%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Horse, each..... $6.75
Stewart's Patent Sheep Shearing Machine, each..... $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 20%

Clips, Axle—

Regular Styles, list July 1, '07, 80&80&10%

Cloth and Netting, wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs..... 70%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Wm. Schollhorn Co.:
Excelsior Dividers..... 60%
Lodi Dividers..... 70&10%

Conductor Pipe,—

	Gal. Steel.	*Charcoal.*
L. C. L. to Dealers:		
Eastern	70&10%	50&10&2½%
Pittsburgh	75&10&5%	60%
Central	75&10%	60%
Northwestern,	75&7½%	60%
Western	70&12½%	50&12½%
Tennessee	70&10%	50&12½%
Southern	70%	50&12½%
Southwestern,	70%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized,ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coppers' Tools—

See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 22&25¢; lighter than 3 lb. to pair.....24@27¢

Cord— Sash—

Braided, Drab.....*lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 21¢; No. 7, 21½¢; No. 6, 22½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....*lb.*, 11@11½¢
Cotton Sash Cord, Tw'ted..18@20¢
Patent Russia.....*lb.*...20¢
Cable Laid Russia.....*lb.*...21¢
India Hemp, Br'd'd.....*lb.*...21¢
India Hemp, Twisted...*lb.*13@14¢
Patent India, Twisted..*lb.*...17¢
Pearl Braided, cotton, No. 6, ℔ lb. 27½¢; No. 7, 26½¢; Nos. 8 to 12, 26¢
Eddystone Braided, Nos. 8 to 12, 26¢; 7, 26½¢; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to10.....℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@ 50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White...℔ lb 40¢
Massachusetts, Drab....℔ lb 45¢
Phoenix, White, Nos 8 to 12....27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906.....90@—%
Hendryx Standard Wire Picture Cord, old list, 85&10%
Turner & Stanton Co. Wire Picture Cord ..... 85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers.
Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepperds'—

Fort Madison, per doz., Heavy, $5.50; Light $5.00

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden..... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz, $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—

American 30%

Nos.	401	402	403	404	405	406	407
Each	$5	$7	$10	$12	$25	$50	$65

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$1.50	$6	25@25&7½%

No. 202, $1.50..... 40&7½%
P., S. & W. Co.:
Dixon's .....℔ doz. 33⅓%

Nos...	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal ..... 40@10&5%
Hales ..... 60&10&5%
Little Giant.....℔ doz. 40&50%

Nos..	305	310	312	320	322
	$35.00	$18.00	$14.00	$72.00	$68.00

New Triumph No. 605, ℔ doz. $24.00, 40&10%
Russwin Food, No. 1, $24.00; No. 2, $27.00 ..... 45&10&10%

	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater .....℔ doz, $4.00

Tobacco—

All Iron, Cheap...*doz, $4.25@4.50*
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Imp'ved Post Hole Auger..40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.75
Split Handle Post Hole Diggers, ℔ doz., $7.75
Hercules Pattern, ℔ doz.....$10.00
Kohler's, ℔ doz., Universal, $15.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Post Hole Diggers, ℔ doz., $24.00..... 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines.....$1.50@1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved 40%
Ratchet, No. 012..... 40%
Ratchet, Celebrated..... 40%
Ratchet, Whitney's, P., S. & W., 50&5%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00..... 33⅓%

Twist Drills—

Bit Stock.....70@70&5%
Taper and Straight Shank, 60&10@70%

Drivers, Screw—

Screw Driver Bits, per doz...45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Disston's 70%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Smith & Hemenway Co., Neverturn, 66⅔%; Elmora, 60%; Star, 30&10%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory...	*Gal. Steel.*	*Charcoal. Iron.*
Eastern	75&10&5%	60&20%
Pittsburgh	80&20%	65&10%
Central	80&10&10&2½%	65&10%
Northwestern	80&10&10%	65&10%
Western	80&10%	60&10&5%
Tennessee	80&5%	60&10&5%
Southern	80%	60&10&5%
Southwestern	75&10&2½%	60&5%

Terms,—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are made in some sections.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge.....85&85&10%
No. 26..... 50%
No. 24..... 25%
No. 22..... 10%

Elbows, Stove Pipe—

Edwards, Standard Blue....40&10&10%
Edwards, Royal Blue.....40&10&10%
Reeves, Dover, one piece.....40&10%

Emery, Turkish—

	¼ to ⅝:	*½ to 2:*	*Flour.*
Kegs.....*lb.*	5¢	5½¢	3½¢
½ Kegs.....*lb.*	5½¢	5¾¢	3¾¢
¼ Kegs.....*lb.*	5½¢	6¢	4¢
10-lb. cans, 10 in case....6½¢	7¢	6¢	
10-lb. cans, less than 10.....10¢	10¢	8¢	
Less quantity..10¢	10¢	8¢	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's ..... 50&10%
Walling's ..... 40&10%
Upson's Patent 40%

Cord and Weight—

Ives and Titan 33⅓%

Corrugated—

Acme Corrugated Fasteners 70%

Faucets—

Cork Lined ..... 50&10@60%
Metallic Key, Leather Lined, 60&10@70%
Red Cedar ..... 40&5@40&10&5%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl. Key. 50&10%
John Sommer's Duplex Metal Key .. 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined .. 50%
John Sommer's Reliable Cork Lined .. 50&10%
John Sommer's Chicago Cork Lined. 60%
John Sommer's O. K. Cork Lined .. 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
Self Measuring:
Enterprise, ℔ doz. $36.00 ..... 40&10%
Lane's, ℔ doz. $36.00 ..... 40&10%
National Measuring, ℔ doz. $36. 40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.

Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@80%
Lower Grade ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 35 1-3@40%

Fixtures, Fire Door—

Allith Underwriters' Approved 50%
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

P., S. & W. Co. 25%
Reading Hardware Co. 60%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 60%
Victor, Header 60%
Champion, Hay 60½%
Champion, Header 60%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Wood Saw—

White, S'g't Bar, per doz. 75@80%
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped .. 3.65
Waterproof Dbl. Taped .. 4.40
Waterproof Tpl. Taped .. 5.15

10&5%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80@80&5%

Gauges—

Marking, Mortise, &c. 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Disston's Marking, Mortise, &c. .. 67½%
Wire, Brown & Sharpe's 33⅓%
Wire, Morse's 25%
Wire, P., S. & W. Co. 33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1. $2.00; 2, $2.30
Spike, Metal, No. 1. $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush .. 25&10@30%
Elwell's 40%

Grease, Axle—

Common Grade ..... gro. $6.00@6.50
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grinders—

Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00 ..... 33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted 40%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&5@60&10%
Bridgeport Chain Co.:
Triumph Coil and Halters. 35&2½@40%
Brown Coil and Halters. 45@50&5%
Brown Cow Ties. 50&5@50&10&5%
Brown Tie Outs. 70&10@75&5%
Covert Mfg. Co.:
Web ..... 30&2%
Jute Rope 35%
Sisal Rope 20%
Cotton Rope 45%
Hemp Rope 40%
Oneida Community:
Am. Coil and Halters. 40@40&5%
Am. Cow Ties. 45@50%
Niagara Coil and Halters. 45@50&5%
Niagara Cow Ties. 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'. 55&10@55&10&5%
Heller's Farriers'. 40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel 50%
Farriers' ..... 40&10&5%
Riveting 50%
Machinists', revised list. 66⅔&5%
Blacksmiths' ..... 50&5%
Fayette R. Plumb:
A. E. Nail. 40&2½@40&12½%
Eng. and B. S. Hand. 50&10&5@60&5%
Machinists' Hammers. 60@60&10%
Rivet and Tinners'. 40&7½@40&12½&5%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢ ... 80&10%
3 to 5 lb., per lb., 40¢ ..... 80&10%
Over 5 lb., per lb., 30¢ .....
Over 5 lb., per lb., 30¢ . 80&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c. ... 60&10@60&10&5%
Hoe, Rake, &c. 40%
Fork, Shovel, Spade, &c.:
Long Handles 40%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ... gro. $3.00@$3.50
Brad Awl ..... gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; *Hickory* ..... $2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; *Hickory* ... $1.60@$1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted ..... gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; *Not Varnished* ... 65@75¢
Plane Handles:
Jack, doz. .30¢; *Fore, doz.* .45¢.
Chapin-Stephens Co.:
Carving Tool ..... 30@30&10%
Chisel ..... 60@60&10%
File and Awl ..... 60@60&10%
Saw and Plane ..... 30@30&10%
Screw Driver ..... 30@30&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 15&10%
Nicholson Simplicity File Handle .... ℔ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ℔ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00 ..... gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ℔ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 in., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ℔ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ℔ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ℔ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ℔ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ℔ doz., 12 to 14 in., $2.00.

50%

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&2½%
Roller Bearing ..... 70&2½%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00. 60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00 ..... 60&10%
Bull Dog, $24.00 ..... 70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&10%
Hinged ..... net $6.08
Covered ..... 60&5%
Special ..... 70&5%
Lawrence Bros.:
Advance ..... 55&10%
Cleveland ..... 70&7½%
Clipper, No. 75 ..... 60%
Crown ..... 55&10%
Cyclone, No. 40 ..... net $6.50
Tandem, No. 50 ..... net $7.50
New York ..... 55&10%
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2. 70%
Anti-Friction 60%
Hinged Hangers, King Charm. 60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3. $2.25
Roller B'r'g St'l Track No. 12. $2.20
Roller B'r'g St'l Track No. 13. $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19. 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22. —50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Underwriters F. D. No. 101 ..... 50%
Tandem No. 44. 2½ and 3 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1. $2.25
Trolley B. D. No. 20. 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2. 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48. 60&5%
Folding Door B. B. Swivel No. 135 ..... 40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing. 50&15&10&5%
Myers' Stayon Hangers 60%

Extra 10% often given.

Hangers— Garment—

Pullman Trouser, ℔ gro., No. 1, $9.00; No. 4, $24.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops $10.00
Victor Folding ..... ℔ gro. $9.60

Gate—

Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp ..... 50&10%
McKinney's Perfect Hasp, ℔ doz. 60%

Hatchets—

Regular list, first qual. 40&2½%—
Second quality ..... 50&5%—

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50 ..... 25%
Clark Coal, ℔ doz., $0.75 ..... 20%

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Acme, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%

Stanley's Steel Gravity Blind Hinges, No. 164½, ℔ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&5%
Acme, Lull & Porter 75%
Queen City Reversible 75%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&5%
Tip Pat'n, No. 1 ..... 75&10%
No. 3 ..... 75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 70&10&5%
Shepard's Double Locking 75%
Champion Gravity Locking ..... 75&5%
Pioneer ..... 75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch ..... doz. ... @$2.00
Without Latch ... doz. ... @$1.60
Reversible Self-Closing:
With Latch ..... doz. ... @$1.75
Without Latch ... doz. ... @$1.35
Western:
With Latch ..... doz. $1.75
Without Latch ..... doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3 ..... 70%

Pivot Hinges—

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 50%

Spring Hinges—

Holdback, Cast Iron ... $6.75@$7.00
Non-Holdback, Cast Iron $6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 40%
Bardsley's Patent Checking. 33⅓%
Bommer Bros.:
Bommer Ball Bearing Floor. 40%
Bommer Spring Hinges 40%
No. 999 Wrot, Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor. 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Columbian Hinges ..... 60&10%
Gem, new list 30%
Clover Leaf ..... ℔ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr. $9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge ..... 25&10&10%
Standard Double Acting Floor Hinge ..... 25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges .. 50&10%
Heavy Strap Hinges .. 60&5%
Light T Hinges 50%
Heavy T Hinges 40%
Extra Hvy. T Hinges. 50&10%
Hinge Hasps 33⅓%
Cor. Heavy Strap ... 60&5%
Cor. Ex. Heavy T ... 50&10%

Extra 10&7½%

Screw Hook and strap.
6 to 12 in. .. lb. 3½¢
14 to 20 in. .. lb. 3½¢
22 to 36 in. .. lb. 3 ¢

Screw Hook and Eye:
¾ to 1 inch ..... lb. 6½¢
⅝-inch ..... lb. 7½¢
½-inch ..... lb. 8½¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers .. 30&2%

Hods— Coal—

M'f'gr's list, price per gross.

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	43	48	52	56
Jap. Funnel	33	36	39	43

10&7½&5%

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162 ..... each $1.05
Steel Mortar, No. 158 ..... each $1.35

Hoes— Eye—

Scovil and Oval Pattern ..... 60&10@60&10&10%
Grub, list Feb. 28, 1899 ..... 70&10@70&10&10%
D. & H. Scovil 27½%
Am. Fork & Hoe Co. (Scovil Pattern) 60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$3.20
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 40&5%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz., 60&10%
Ft. Madison Dixie Tobacco Hoe..... 75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.40
B. B., 6½ in.....$3.50
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₱doz.$5.25

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze 25%
Empire 50%
Pullman 25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip 50%
Superior 33⅓%

File and Tool—

Nicholson File Holders and File Handles .....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs $1.25
Dash Rein Holder, ₱ doz. pairs..$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt 80%
Wire C. & H. Hooks.....80%
Bradley Metal Clasp Wire, Coat and Hat, 70&10%; Ceiling.....70&10%
Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King..70&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton .....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.— See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz.$3.00
Grass, common grades, all sizes, per doz *$1.50*
Whiffletrees .....*lb.5¾@6¢*
Hooks and Eyes:
Brass .....*60@60&10%*
Malleable Iron.....*70@70&10%*
Coverdale Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Turner & Stanton Co, Cup and Shoulder .....80&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....*ft. 5@ 6¢*
3-ply Guaranteed.....*ft. 8@ 9¢*
4-ply Guaranteed.....*ft.10@11¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8@ 9¢*
Fair Quality.....*ft.10@11¢*

Irons— Sad—

From ¼ to 10.....*lb. 3@3½¢*
B. B. Sad Irons.....*lb.3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	83	80	93	91
Tin'd Tops	88	85	98	95

New England Pressing..lb.3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60%

Pinking—

Pinking Irons.....*doz.80¢*

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport 50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....75%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*80&10@—%*
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's .....66⅔@70%
Watrous 16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz..$5.50@5.75
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers' .....*doz.$2.60@3.55*
Westenhoim's .....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro .$1.25@$1.40*
Carriage, Jap., all sizes..... *gro. 40@45¢*
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40&10%
Reading 60%

Lanterns—Tubular—

Regular, No. 0.....*doz .$4.35@4.50*
Side Lift, No. 0.....*doz. $4.60@4.75*
Hinge Globe, No. 0..doz. $4.60@4.75
Other Styles.....*40@40&10%*

Bull's Eye Police—

3-inch .....*$4.25@4.50*

Latches— Thumb—

Roggin's Latches, with screw.. *doz. 35@40¢*

Door—

Allith Mfg. Co., Reliable and Allegator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.30
Richards' Bull Dog, Heavy, No. 125 .....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....*doz. 50¢; large, 80¢*
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.50*	*2.25*	*2.00*
75 feet	*$2.10*	*1.80*	*1.65*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks— Cabinet—

Cabinet Locks.....*33⅓%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass .....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55&5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40&20%; Robinson Pat. Ventilating Sash Lock, 33⅓%.
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%

Machines—Boring—

Com. Upr't, without Augers, *$2.00@2.25*
Com. Angl'r, without Augers, *$2.25@2.50*
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls..... 5.75
Snell's, Upright, $2.65; Angular, $2.90

Corking—

Reisinger Invincible Hand Power.... ₱ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclone High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Washing

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$57.00
Champion Rotary Banner No. 1	$57.00
Standard Champion No. 1	$50.00
Standard Perfection	$27.00
Cincinnati Square Western	$33.00
Uneeda American, Round	$33.60

Mallets—

Hickory .....*45&5@50%*
Lignumvitæ .....*45&5@50%*
Tinners' Hickory and Applewood .....*doz. 45&5@50%*

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%
Lippincott's 30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; 12-in., $2.10, etc.
Cheap, 10-in., $2.25; 12-in., $2.45, etc.
Better Grade, 10-in., $3.00; 12-in., $3.25, etc.

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*
Continental				60%
Great American				70%
Great American Ball B'r'g, new list.				70%
Quaker City				70%
Pennsylvania				60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%				
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%

Granite State:
Style A, Low Wheel.....70%
Style B, Low Wheel.....70%
Style C, High Wheel, spcl. list, 70&10%
Style D, High Wheel, spcl. list..70%
Philadelphia:
Styles M., S., C., K., T....70&10&5%
Style A, all Steel.....60&10&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.40%
Horse .....40&5%
Pony .....40&5%
36-in. Horse.....30&10%
Eagle Horse.....30&5%
I. X. L. Horse.....50%

Nails—

Wire Nails and Brads. Miscellaneous .....*85&10@85&10&10%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	.....10%

Western .....₱ lb 8½¢
Jobbers' Special Brands..... *per lb .9@10¢*

Picture—

	1½	2	2½	3	in.
Brass H'd	.45	.55	.60	.70	.. gro
Por. Head	..	1.10	1.10	1.10	.. gro

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Square, Blank or Tapped..*5.80¢*
Hexagon, Blank or Tapped.6.30¢
Square, Blank or Tapped, C., T. & R.....*5.60¢*
Hexagon, Blank or Tapped, C., T. & R.....*6.30¢*
Hot Pressed:
Square, Blank.....*5.80¢*
Hexagon, Blank.....*6.30¢*
Square, Tapped.....*5.50¢*
Hexagon, Tapped.....*5.90¢*

Oakum—

Best .....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy .....*lb., 5¢*
Plumbers' Spun Oakum..*2¾@3¢*

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....*75%*
Chase or Furnayon:
Brass and Copper.....*50&10%*
Zinc .....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*

Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
Yankee Can and Bottle Opener, ₱ doz., net, $0.75; Little Gem, ₱ doz., net.....$0.65

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....*20¢*

Rubber—

(Fair quality goods.)
Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₱ lb. 80¢.....25%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute .....*lb. 4@4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.....*65&7½@70%*
Edwards, Royal Blue.....65&7½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: *lb.*
Roll Board or Building Felt, 5 to 30 lb., per 100 sq. ft. *2½@3¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....*3½¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....*3¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll *48@58¢*
Medium weight, 30 lbs. to roll. *56@70¢*
Heavy weight, 40 lbs. to roll *75@78¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$5.50*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 400 sq. ft.), ton.... *$34.00@$38.00*
2 ply, roll 108 sq. ft.....*65¢*
3 ply, roll 108 sq. ft.....*88¢*
Slater's Felt (roll 500 sq. ft.).*80¢*

Sand and Emery—

Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'h..50&10@60%

Parers— Apple—

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy .....each $19.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger .....each $25.00
Livingston Nail Co.:
Daisy .....₱ doz. $4.00
Little Star.....₱ doz. $5.00
Rocking Table.....₱ doz. $6.20
Reading Hardware Co.:
Advance .....₱ doz. $4.00
Baldwin .....₱ doz. $4.00
Reading 72.....₱ doz. $3.25
Reading 78.....₱ doz. $6.25

Potato—

Saratoga .....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

(List Jan., 1908.)
List .....*70&10@70&10&10%*
Cronk's Handled Garden Mattock, ₱ doz., No. 2, $2.60; No. 3, $3.40.

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....50@50&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Standard 2-6 in.....60&5@—%
Extra Heavy, 2-6 in..70&5@—%
Fittings, Standard and Heavy, 70&10@75%

Pipe, Merchant—

	Consumers, Carloads. Steel. Blk.	Galv.	Iron. Blk.	Galv.
	%	%	%	%
⅛ & ¼ in...	64	48	62	..
⅜ in.....	66	52	64	50
½ in.....	68	56	66	54
¾ to 6 in...	72	62	70	60
7 to 12 in....	69	54	67	52

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 87%
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue....	$6.25	$7.25
6 in., Standard Blue....	6.75	7.75
7 in., Standard Blue....	7.75	8.75
5 in., Royal Blue.....	7.00	8.00
6 in., Royal Blue.....	7.50	8.50
7 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color..	$6.15	$7.15
6 in., Uniform Color..	6.65	7.65
7 in., Uniform Color..	7.65	8.65

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....30@30&10%
Bench, second qual...40@40&10%
Molding .....25@25&10%
Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 40%

Iron Planes—

Chaplin's Iron Planes.....50&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons, list Dec. 12, '06.....25%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.00

Plates—

Felloe .....lb. 4@4¼¢

Pliers and Nippers—

Button Pliers...75&5@75&10&5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 $2.00 | 8 $2.25 | 10 $2.75 | 12-in. $3.50
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....30%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....30%
Stub's Pattern.....45%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels....60&10%
Disston's Pocket Levels.....60&10%
Stanley's Duplex.....33⅓%
Woods' Extension.....33⅓%

Points, Glaziers'—

Bulk and 1-lb. papers....lb. 9 ¢
½-lb. papers.....lb. 9½¢
¼-lb. papers.....lb. 10 ¢

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—

Prestoline Liquid, No. 1 (¼ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....60%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside .....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese .....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50

Poppers, Corn—

1 qt. Square..doz.$0.80; gro.$8.75
1 qt. Round..doz.$0.90; gro.$10.00
1½ qt. Square.doz.$1.00; gro.$11.00
2 qt. Square..doz.$1.25; gro.$13.50

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled .....35&10%
Tinned .....50&10%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk).....	$12.00	$15.00
Half Keg (12½ lb bulk)..	6.25	7.75
Quarter Keg (6¼ lb bulk).	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17.00
Half case 12 (1 lb c. bk)..	7.25	8.75

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears—

See *Shears.*

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B.....70%
Giant 50%
Staple Pullers, Utica and Davison 60%

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz....	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....20@22¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle.....17@20¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in.....20½¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26..1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—

Cistern 60%
Pitcher Spout.....75&5@75&10%
Wood Pumps, Tubing, &c....80%
Barnes Dbl. Acting (low list)....40&5%
Barnes Pitcher Spout.....5&10%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....50%
Flint & Walling's Fast Mail (low list) 50%
Flint & Walling's Tight Top Pitcher. .....75&10%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....40&5%
Myers' Power Pumps.....40&5%
Myers' Spray Pumps.....40&5%

Pump Leathers—

Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*	80%
	$5.00	6.00	7.00	8.00	

Cup Leathers—Per 100:					
Inch....	2¼	3	3½	4	80%
	$5.00	7.00	9.00	12.00	

Punches—

Saddlers' or Drive, good..... *doz. 50@75¢*
Spring, single tube, good quality $1.75
Revolving (4 tubes)....*doz.*$3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 35%; Paragon, 50%; Lodi.....55%
Tinners' Hollow, P., S. & W. Co..40%
Tinners' Solid, P., S. & W. Co.. ℔ doz., $1.44.....40%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..℔ ft. 3¼¢
O. N. T. Rail.....$3.12
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft. $3.45
O. N. T., ℔ 100 ft., 1 in., $3.00; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
McKinney's:
Hinged Hanger Track, ℔ ft., 11¢, 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&5%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—

NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Cronk's:
Steel Garden: Champion, 75%; Ideal, 80%; Victor.....80&25%
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00.....net
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Lawn Queen, 20-tooth....℔ doz. $3.15
Lawn Queen, 24-tooth....℔ doz. $3.25
Paragon, 20-tooth.....℔ doz. $2.70
Paragon, 24-tooth.....℔ doz. $2.75
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $2.00@2.25

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.70&10@75%
McCaffrey's American Standard, 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Liana Bo-ras-ic.....60%
Fox Razors, ℔ doz., No. 42, $36.00; No. 44, $20.00; No. 82, Platina, $25.00. } Dis. 40%
Red Devil.....65%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9½, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%.
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P., 102 PN, 202 P., 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed .....70@70&10%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal..40%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal..$2.00
Double Action, 44 caliber....$2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade

16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—

Bull Rings—

	⅞	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.25@$4.50
Hill's Ringers, Gray Iron, doz., 60@75¢
Hill's Ringers, Malleable Iron.. doz.80@95¢
Blair's Rings..per gro.$5.00@$5.50
Blair's Ringers...per doz.75@90¢
Brown's Rings.per gro.$5.25@$5.50
Brown's Ringers..per doz.75@90¢

Rivets and Burrs—

Copper 50%
Carriage, Coopers', Tinners, &c.:
Black .....70&10%
Metallic Tinned.....70%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, 23@25¢; Tin boxes, 100 count, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Cronk's Stay, No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—

Manila, 7-16 in. diam. and larger: Pure .....lb., 10½@11½¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 7½@8¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 6½@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 6¼@7¢
Pure .....lb., 7¾@8¼¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....lb., 5¼@5¾¢
Pure .....lb., 6½¢
Cotton Rope: Best, ¼-in. and larger...18@20¢
Medium, ¼-in. and larger.16@17¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb., 6¼¢
Thread, No. 2, ¼-in. & up, lb., 5¾¢

Wire Rope—

Galvanized .....37½&2½%
Plain .....45&2½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, 35%; Sisal.....20%

Rules

Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory .....25@25&10%
Miscellaneous.....50@50&10%
Stephens' Combination.....55%
Stationers' .....50@50&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—

See *Balance, Sash.*

Sash Locks—

See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—

See *Stuffers or Fillers, Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—

See *Sets, Saw.*

Saw Tools—

See *Tools, Saw.*

Saws—

Atkins':
- Circular 45%
- Band ..... 50@50&10%
- Butcher Saws 50%
- Cross Cuts 35%
- One-Man Cross Cut 40%
- Narrow Cross Cut 50%
- Hand, Rip and Panel ..... 35&5%
- Miter Box and Compass 40%
- Mulay, Mill and Drag 45%
- Wood Saws ..... 40&10%

Chapin-Stephens Co.:
- Turning Saws and Frames ..30@30&10%

Diamond Saw & Stamping Works:
- Sterling Kitchen Saws ..... 30&10&10%

Disston's:
- Circular, Solid and Ins'ted Tooth..50%
- Band, 2 to 18 in. wide 60%
- Band, ¾ to 1¾ 60%
- Crosscuts 45%
- Narrow Crosscuts 50%
- Mulay, Mill and Drag 50%
- Framed Woodsaws 25%
- Woodsaw Blades 25%
- Woodsaw Rods, Tinned 15%
- Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
- Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
- Compass, Key Hole, &c 25%
- Butcher Saws and Blades 30%

C. E. Jennings & Co.'s:
- Back Saws 16⅔%
- Butcher Saws ..... 25&7½%
- Compass and Key Hole Saws, 33⅓&7½%
- Framed Wood Saws ..... 25&7½%
- Hand Saws 12½%
- Wood Saw Blades ..... 33⅓&7½%

Millers Falls:
- Butcher Saws ..... 15&10%
- Star Saw Blades ..... 15&10%

Massachusetts Saw Works:
- Victor Kitchen Saws ..... 40&10&50%
- Butcher Saws Blades ..... 35@40%

Peace & Richardson's Hand Saws ..30%

Simonds':
- Circular Saws 45%
- Crescent Ground Cross Cut Saws..30%
- One-Man Cross Cuts ..... 40&10%
- Gang Mill, Mulay and Drag Saws..45%
- Band Saws 50%
- Back Saws ..... 25@25&7½%
- Butcher Saws ..... 35@35&7½%
- Hand Saws ..... 25@25&7½%
- Hand Saws, Bay State Brand 45%
- Compass, Key Hole, &c..25@25&7½%
- Wood Saws ..... 40&7½%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%

Disston's:
- Concave Blades 25%
- Keystone Blades 35%
- Hack Saw Frames 30%

Simonds File Co 35%

C. E. Jennings & Co.'s'
- Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
- Hack Saws, Nos. 175, 180, complete, 40&7½%

Goodell's Hack Saw Blades ..... 40&10%

Grimm's Hack Saw Frames..35&5&10%

Griffin's Hack Saw Blades ..... 35&5&10%

Star Hack Saws and Blades ..... 15&10%

Sterling Hack Saw Blades ..... 30&10&5%

Sterling Hack Saw Frames..30&10&10%

Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%

Victor Hack Saw Blades 20%

Victor Hack Saw Frames 40%

Whitaker Mfg. Co.:
- National Hand Blades 40%
- National Hand Frames ..... 30&5%
- National Power Blades ..... 30&10%

Scroll—

Barnes, No. 7, $15 ..... 25%

Barnes' Scroll Saw Blades 40%

Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%

Lester, complete, $10.00 ..... 15&10%

Rogers, complete, $3.50 and $4.00.. 15&10%

Scales—

Family, Turnbull's ....50@50&10%

Counter:
- *Hatch, Platform, ½ oz. to 4 lbs. ..... doz., $5.50*
- *Two Platforms, ½ oz. to 8 lbs. ..... doz., $16.00*
- *Union Platform, Plain $1.70@1.90*
- *Union Platform, Stpd. $1.85@2.15*

Chatillon's:
- Eureka 25%
- Favorite 40%
- Crocers' Trip Scales 50%

The Standard Portables 40%

The Standard R. R. and Wagon ..... 50&10%

Scrapers—

Box, 1 Handle ..... doz. $2.00@2.25

Box, 2 Handle ..... doz. $2.50@2.60

Ship .... Light, $2.00; Heavy, $1.50

Chapin-Stephens Co., Box...30@30&10%

Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75

Bench, Wood ..... 20@20&10%

Hand, Wood ...70&10@70&10&10%

Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80@80&5%

Coach, Gimlet Point ..75&10@80%

Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%

Millers Falls ..... 50&10&10%

Swett Iron Works ..... 70@75%

Machine—

Cut Thread, Iron, Brass or Bronze:
- *Flat Head or Round Head, 50@50&10%*
- *Fillister Head ..... 40@40&10%*
- *Rolled Thread, F. H. or R. H., Iron ..... 75&10%*
- *F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%*

Set and Cap—

Set (Iron) ..... 75&10&7½%

Set (Steel), net advance over Iron 25%

Sq. Hd. Cap ..... 70&10&7½%

Hex. Hd. Cap ..... 70&10&7½%

Rd. Hd. Cap ..... 50&7½%

Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.

Flat Head, Iron ..... 87½&5@.. %

Round Head, Iron ..... 85&5@.. %

Flat Head, Brass ..... 80&5@.. %

Round Head, Brass ..77½&5@.. %

Flat Head, Bronze ..... 75&5@.. %

Round Head, Bronze .72½&5@.. %

Drive Screws ..... 87½&5@.. %

Scroll Saws—

See *Saws, Scroll.*

Scythes—

	Per doz.
Grass, No. 1, Plain	$7.00@7.50
Clipper, Bronzed Webb	$7.25@7.75
No. 3 Clipper, Pol'd Webb	$7.50@8.00
No. 6 Clipper and Solid Steel	$7.75@8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13	$7.25@7.75
Grain, No. 1	$9.00@9.50
Bronzed Webb, No. 1	$9.25@9.75
Nos. 3 and 4 Clipper, Grain	$9.50@10.00
Solid Steel, No. 6	$10.00@10.50

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%

Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18..20&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ₩ doz sets $9.00

Sets, Nail—

Octagon ..... gro. $3.50@3.75

Buck Bros. 27½%

Cannon's Diamond Point, ₩ gro. $12 ..... 40&10%

Mayhew's ..... ₩ gro $9.00

Snell's Corrugated, Cup Pt. ..... 40&10%

Snell's Knurled, Cup Pt. ..... 40&10%

Victor Knurled Cup Pt. ..... ₩ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
- Criterion 40%
- Adjustable 40%

Disston's Star, Monarch and Triumph 30%

Morrill's No. 1 ..... $15.00
- Nos. 3 and 4, Cross Cut $20.60
- No. 5, Mill $30.00
- Nos. 10, 11, 95 ..... $15.60
- No. 1 Old Style $10.00
- Special $10.00

Giant Royal Cross Cut ..... ₩ doz. $8.00

Royal, Hand ..... ₩ doz. $4.50

Taintor Positive ..... ₩ doz. $4.75

Shaving—

Fox Shaving Sets, No. 30 ..... ₩ doz., net, $24.00

Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
- Fast Cut Pocket Knife Hones, ₩ doz $1.50
- Mounted Kitchen Sand Stone, ₩ doz $1.50
- Natural Grit Carving Knife Hones, ₩ doz $3.00
- Quick Cut Emery Carving Knife Hones, ₩ doz $1.50
- Quick Edge Pocket Knife Hones, ₩ doz $2.50

Skate—

Smith & Hemenway Co., Eureka..50%

Shaves, Spoke—

Iron ..... doz. $1.25

Wood ..... doz. $2.00

Bailey's (Stanley R. & L. Co.) 45%

Chapin-Stephens Co. ..... 30@30&10%

Goodell's, ₩ doz. $9.00 ..... 15&10%

Shears—

	7	8	9 in.	
Cast Iron				
Best	$16.00	18.00	20.00	gro.
Good	$13.00	15.00	17.00	gro.
Cheap	$5.00	6.00	7.00	gro.

Straight Trimmers, &c.:
- *Best quality Jap ....70@70&10%*
- *Best quality, Nickel ..60@60&10%*

Tailors' Shears ..... 40@40&10%

Acme Cast Shears ..... 40@40&5%

Heinisch's Tailor's Shears 10%

Wilkinson Shear & Cutlery Co.:
- Sheep, 1900 list ..... 30&10&5%
- Grass ..... 50&10%
- Horse or Mule ..... 50&10%

J. Wiss & Sons Co.:
- Best Quality Jap'd ..... 60&10%
- Best Quality Nickeled ..... 50&10%
- Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%

Steel Field Blades ..... 40&10@50%

Forged Handles, Steel Blades, Berlin 50%

Heinisch's Snips 40%

Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%

Niagara Snips 40%

P. S. & W. Forged Handles, 25% W. R. W. ..... 40&10%

J. Wiss & Sons Co.:
- Wiss Forged Steel 25%

Pruning Shears—

Cronk's Hand Shears 33⅓%

Cronk's Wood Handle Shears 33⅓%

Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00 ..... 25%

Diston's Pruning Hook only, ₩ doz. $12.00 ..... 25%

John T. Henry Mfg. Co.:
- Pruning Shears, all grades 40%

P. S. & W. Co. ..... 40&10%

Columbian Cutlery Co.:
- Hedge, Wilcut Brand ..... 60&10%
- Lawn and Border, Wilcut Brand. 60&10%

Sheaves—Sliding Door—

Reading 40%

R. & E. list 15%

Sliding Shutter—

Reading list 40%

R. & E. list 10%

Shells—Shells, Empty—

Brass Shells, Empty:
- Climax, 10 and 12 gauge ..... 65&10%
- Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
- New Rapid, 10, 12, 16 and 20 gauge, 25&10%
- Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade, 25&5%
- Union, League, 12 and 12 gauge; Rival Grade 25%
- New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge ..... 20&5%
- Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade..20%

Shells, Loaded—

Loaded with Black Powder..40%

Loaded with Smokeless Powder, medium grade ..... 40&5%

Loaded with Smokeless Powder, high grade ..... 40&10&10%

Union Metallic Cartridge Co.:
- New Club, Black Powders 40%
- Nitro Club, Smokeless Powders.40&5%
- Arrow, Smokeless Powders.40&10&10%

Winchester:
- Smokeless Repeater Grade ..... 40&5%
- Smokeless Leader Grade...40&10&10%
- Black Powder 40%

Shingles, Metal— Per Sq.

	Painted.	Galv.
Edwards Mfg. Co.:		
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50
Wheeling Corrugating Co.:		
Dixie, 14 x 20 in...	$4.25	$5.50
Dixie, 10 x 14 in....	4.50	6.00
Dixie, 7 x 10 in....	5.00	6.75

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:

Iron ..... per keg. $4.10

Steel ..... per keg. $3.85

Burden's, all sizes ..... ₩ keg $3.90

Shot—

25-lb. bag.

Drop, up to B $1.85

Drop, B and larger 2.10

Buck 2.10

Chilled 2.10

Dust 2.30

Shovels and Spades—

Association List, Nov. 15, 1902..40%

Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $3.25@$3.50

Wood and Mail, D. Handle, $3.75@$4.00

Sieves and Sifters—

Hunter's Imitation ..... gro. $9.50@10.00

Hunter's Genuine ..... per gro. $12.00@12.50

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ₩ doz. $39.00

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.

Mesh 18, Nested .... doz. $0.90@0.95

Mesh 20, Nested .... doz. $1.00@1.05

Mesh 24, Nested .... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
- *12 x 12 to 22 x 36 in 60%*
- *20 x 40 to 24 x 50 in 50%*
- *24 x 60 to 24 x 120 in 30%*

Barnes' low list:
- Up to and including 20 x 36 in 50&5%
- 20 x 40 to 24 x 50 in 45%

NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@75&10%

Steel ..... 40@45%

Slates, School—

Factory Shipments.

"D" Slates ..... 50@50&10%

Eureka, Unexcelled Noiseless .. 60&5 tens

Victor A, Noiseless .60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%

Covert Mfg. Co.:
- Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
- High Grade, 40%; Trojan 40%
- Jockey 25%

Snaths—

Scythe ..... 55@60%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%

Cheap ..... 60@60&10%

International Silver Co.:
- 1847 Rogers Bros., 40&10%; Rogers & Hamilton ..... 50&10%
- Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
- Anchor, Rogers Brand 60%
- Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢

Tables ..... per gro. $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%

Chicago (Coil) ..... 40&10%

Gem (Coil) 20%

Pullman Door and Gate 10%

Reliance (Coil) ..... 40&10%

Star (Coil) 30%

Torrey's Rod, 39 in. ..... ₩ doz. $1.10

Carriage, Wagon, &c.—

	Per 100 lb.
1¼ in. and Wider:	
Black	$3.75@$5.00
Half Bright	$4.75@$5.00
Bright	$5.25@$5.50
Painted Seat Springs:	
1½ x 2 x 26 ..... per pr. 49@52¢	
1½ x 3 x 28 ..... per pr. 73@77¢	

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
- Cactus, 65%; Japanese, 70%; National, ₩ doz. $12.00

Enterprise ..... 25@30%

Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. List Jan. 5, 1900.

Steel and Iron .. 80@80&5%

Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%

Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%

Disston's Try Squares and Bevels, Rosewood Handle, 60&10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:

Cheap ..... doz. $1.00

Good Grade ..... doz. $1.25

Tinned Iron ..... doz. $0.75@1.25

Iron, Porcelain Lined ... doz. $1.75

Staples—

Barbed Blind ..... 85&5@85&10%

Electricians' ..... 80&10&10@85%

Fence Staples, Plain, $2.15; Galvanized $2.45

Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%

Foster Bros.' 30%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%

Curtis Rev'ble Ratchet Die Stock..25%

Derby Screw Plates 25%

Green River 25%

Lightning Screw Plate 25%

Little Giant 25%

Reece's New Screw Plates 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones—Oil, &c.

Pike Mfg. Co., 1907 list: ₩ lb — 33⅓%
- Arkansas St. No. 1, 3 to 5½ in. ..$2.80
- Arkansas St. No. 1, 5½ to 8 in. $3.50
- Arkansas Slips No. 1 ..... $4.00
- Lily White Washita, 4 to 8 in. 60¢
- Rosy Red Washita, 4 to 8 in. ..60¢
- Washita St., Extra, 4 to 8 in. 50¢
- Washita St., No. 1, 4 to 8 in. 40¢
- Washita St., No. 2, 4 to 8 in. 25¢
- Lily White Slips ..... 90¢
- Rosy Red Slips ..... 90¢
- Washita Slips, Extra ..... 80¢
- Washita Slips, No. 1 ..... 70¢
- Washita Slips, No. 2 ..... 40¢
- India Oil Stones (entire list) 33⅓%
- Quickcut Emery and Corundum Oil Stone, Double Grit 40%
- Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
- Quickcut Emery Rubbing Bricks..40%

Hindostan No. 1, R'g'lar. ₩ lb 8¢

Hindostan No. 1, Small.. ₩ lb 10¢ — 33⅓%

Axe Stones (all kinds) .....

Turkey Oil Stones, Extra, 5 to 8 in. ..... ₩ lb 80¢

Queer Creek Stones, 4 to 8 in. 20¢

Queer Creek Slips ..... 40¢

Sand Stone ..... 8¢

Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S., ₱ gro. $12.00
Lamoille S. S., ₱ gro. $11.00
White Mountain S. S., ₱ gro. $9.00
Green Mountain S. S., ₱ gro. $6.00
Extra Indian Pond S.S., ₱ gro. $7.50
No. 1 Indian Pond S.S., ₱ gro. $7.00
No. 2 Indian Pond S.S., ₱ gro. $4.50
Leader Red End S. S., ₱ gro. $4.50
Quick Cut Emery, ₱ gro. $10.00
Pure Corundum, ₱ gro. $18.00
Crescent, $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
} 33⅓%
Balance of 1904 list 33⅓%
Electro (Artificial), ₱ gro., $12.00 33⅓%
Lightning (Artificial), ₱ gro., $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers, ₱ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ₱ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Acme Embossed, case lots. 20&10&10%
Cary's Universal, case lots. 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points . . doz. 55¢
All Steel Socket . . . doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Bissell Carpet Sweeper Co.:	₱ doz.
Superba, Crotch Mahogany	$36.00
Triumph, Fancy Veneers	$33.00
Parlor Queen, Fig. Rosewood	$30.00
Elite, Hungarian Ash	$29.00
Am. Queen, Fig. Mahogany	$27.00
Ideal, Bird's-Eye Maple	$25.00
Grand Rapids, Nickel,	$24.00;
Japan	$22.00
Standard, Nickel, $22.00; Japan	$20.00
Crown Jewel, Nickel, $21.00; Jap.	$19.00
Crystal, Glass Top	$36.00
Grand, 17 in. wide	$36.00
Parlor Grand	$48.00
Club, 24 in. wide	$54.00
Hall, 28 in. wide	$60.00

NOTE.—Rebates: 50c per dozen on three dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks 90&40%
American Cut Tacks 90&40%
Swedes' Cut Tacks 90&40%
Swedes' Upholsterers' 90&50%
Gimp Tacks 90&50%
Lace Tacks 90&50%
Trimmers' Tacks 90&40%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks 90&50&10%
Hungarian Nails 80&20%
Finishing Nails 70%
Trunk and Clout Nails 80&10%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks 90&6 tens@—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
30	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin 50@—%
Patent Leather 25@30&5%
Steel 33 1-3&5%
Chesterman's 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@33%
Wiebusch & Hilger:
Chesterman's Metallic, No. ML, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger . . . per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. . . . . 30@33⅓%

Ties, Bale—Steel Wire—

Single Loop 82½&10%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Haying—

Myers' Hay Tools 45%

Miniature—

Smith & Hemenway Co.'s, Davidson, ₱ doz., Nickel Plated, $1.50; Gold Plated $2.00

Saw—

Atkins' Cross Cut Saw Tools 35&5%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. . . . . $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 75&10%
Newhouse 45&10%
Hawley & Norton 65%
Victor 75@75&10%
Oneida Community Jump 50%
Hector 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz., $13.25 . . $11.50 doz.
No. 3, Rat, ₱ doz., $6.50 . . . $5.75 doz.
No. 3½, Rat, ₱ doz., $5.25. $4.70 doz.
No. 4, Mouse, ₱ doz., $3.85. $3.00 doz.
No. 5, Mouse, ₱ doz., $3.00. $2.25 doz.
Oneida Community:
Out o' Sight, Mouse, ₱ doz. . . . $0.60
Out o' Sight, Rat, ₱ doz. 1.25
Easy Set, Mouse, ₱ doz. 35
Easy Set, Rat, ₱ doz. 1.00
Wood Choker, Rat, ₱ doz. holes, .12
Premier Tin Choker, 5 hole, ₱ doz. traps 75

Trowels—

Disston Brick and Pointing 25%
Disston Plastering 20%
Disston "Standard Brand" and Garden Trowels 30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in. $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels, ₱ gro. $6.00
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks, ₱ doz. $16.00
Grocery, ₱ doz. $15.00
McKinney Trucks, each, net $10.00
Model Stove Trucks, ₱ doz. $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized	$67	$79	$89	$99

10&10%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls 23@25¢
No. 12, ¼ and ½-lb. Balls 21@23¢
No. 18, ¼ and ½-lb. Balls 18@20¢
No. 24, ¼ and ½ -lb. Balls 17½@19½¢
No. 36, ¼ and ½-lb. Balls 17@19¢
Chalk Line, Cotton ½-lb. Balls 26@31¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz. 11@19¢
Cotton Wrapping, 5 Balls to lb., according to quality 15½@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 14½@15½¢
American 3-Ply Hemp, 1-lb. Balls 15½@16½¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 10½@11½¢
India 3-Ply Hemp, 1-lb. Balls 10½@11½¢
India 3-Ply Hemp, 1½-lb. Balls 10@11¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls 13½@14½¢
Mason Line, Linen, ½-lb. Bls. 47¢
No. 264 Mattress, ¼ and ½-lb. Balls, according to quality 50@60¢
Wool, 3 to 6 ply . . . . B 9¢; A 10¢

Vises—

Solid Box . . . . . 50&5@30&10&5%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Fisher & Norris Double Screw, net, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00.
Fulton Mach. & Vise Co.:
Reed, Swivel 25%
Star, Solid Jaw 40%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch, 50%; Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect, 15%; Lightning Grip 15%
Merrill's 20%
Millers Falls Oval Slide Pattern 60&10%
Parker's:
Victor, 20@25%; Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Rock Island 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps 30%
Perfection Saw Clamps, ₱ doz. $4.60
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
Reed 25%
Star 40%
Massey Vise Co.:
Lightning Grip, 15%; Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
97 Series, 60%; 197 Series, 60&5%; No. 870, 40%.
Rock Island Pipe 25%

Wads—*Price per M.*

B. E., 11 up 60¢
B. E., 9 and 10 70¢
B. E., 8 80¢
B. E., 7 80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25
} *Dis. 15%*

Ware, Hollow—
Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 45&10%
Ground 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs. $3.00
White Enameled Ware:
Maslin Kettles 65&10%
Covered Wares:
Tinned and Turned 35&10%
Enameled 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 33⅓%
Iron Clad Ware 70&10%
Lava and Volcanic, Enameled 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&30&50&10%
Never Break Spiders and Griddles 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame $4.05
Red Star, family size, stationary protector $4.05
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $3.55
Cable Cross, family size, stationary protector $3.60
Single Zinc Surface:
Naiad, family size, open back, perforated $3.00
Single Saginaw Globe $2.85
Brass Surface:
Brass King, Single Surface, open back $4.05
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.60
Glass Surface:
Glass King, Single Surface, open back $3.95
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.95

Washers—Leather, Axle—

Solid . . . . . 90@90&10%
Patent . . . . . 90@90&5%
Coil: ⅞ 1 1⅛ 1¼ *Inch.*
9¢. 10¢. 11¢. 14¢. *per box*

Iron or Steel—

Size bolt . . . . 5-16 ⅜ ½ ⅝ ¾
Washers $4.65 3.75 2.45 2.25 2.05
The above prices are based on $6.75 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots . . . . per lb. 1¾@2¢

Wedges—

Oil Finish . . . . . *lb.*, . . @3¢

Weights—Hitching—

Covert Mfg. Co. 30&2%

Sash—

Per net ton, f.o.b. factory:
Eastern District . . . $25.00@$28.00
Southern Territory . $22.00@$24.50
Western and Central Districts . . . . . $22.50@$23.50

Wheels, Well—

8-in., $2.00; 10-in., $2.45; 12-in., $3.25; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 . . . . . 72¢10&7½%
10 to 18 . . . . . 72½¢10&10%
19 to 26 . . . . . 75¢10&10¢2½%
27 to 36 . . . . . 77½¢7½%
Galvanized:
6 to 9 . . . . . 72½¢10%
10 to 14 . . . . . 72½¢10&5%
15 to 16 . . . . . 72½¢10&5%
17 to 18 . . . . . 72½%
19 to 26 . . . . . 70&5¢2½%
27 to 36 . . . . . 65¢10&10%
Coppered:
6 to 9 . . . . . 65¢10&10%
10 to 14 . . . . . 70&10&5%
15 to 18 . . . . . 65¢10¢10&10%
19 to 26 . . . . . 70&5¢2½%
27 to 36 . . . . . 72½¢10¢2½%
Tinned:
6 to 18 . . . . . 67¢10&10%
Brass . . . . . 17¼¢ *lb., base*
Copper . . . . . 32¢ *lb., base*
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned, 70¢10&10&10%
Brass and Copper . . 60¢10&10&10%
Retailers' Assortments, per box, $2.10@$2.40
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods . . . . 90&25@—%
Brass Wire Goods . . . . 90@90&10%
Brass Cup and Shoulder Hooks, 80&15%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&2½@80&7½%
Painted Screen Cloth, 100 ft., $1.35
Standard Galv. Hardware Grade: Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural . . . . . 80&10&10%
Alligator or Crocodile . . 70&10@75%
Baxter Pattern S Wrenches . . . 70&5@70&10%
Drop Forged S . . . . . 45@45&5%
Acme 60&10%
Alligator Pattern, 70%; Bull Dog . . 70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Steel Handle Nut 50%
Combination Black 40&5%
Merrick Pattern 50%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model . 40&10&5&5%
Coes', Genuine Hammer Handle . . . . . 40&10&5&5%
Coes' "Mechanics'" . . . 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 70%
Gem Pocket 50%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W., 50&10%; full cases 50&10&5%
Stillson 65%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle, 40&10&5%
Other Wrenches 50%
Vulcan and Agrippa Chain 50%
Whitaker Machinists':
Case lots 50&10%
Less than case lots 50%

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 . . . . . 85&10&10%

Zinc— (*Cask lots at mill.*)

Sheet . . . . . *per 100 lb.*, $7.00